

where the disease rebounded to equal the high morbidity rates of the last century. Southern and southeastern Europe was mercifully spared these wartime increases, possibly due in part to the fact that it was recovering from high rates during the previous decade when northwestern Europe had been enjoying a moderate decline unattributable to immunization.

The pre-war years had, however, been marked by several features which held an ominous foreboding for the diphtheria situation. The first of these was the obvious prevalence in Europe of a form of diphtheria appreciably more malignant than that which prevailed in the United States. This form had been repeatedly described in England and Germany as well as in other countries. In Germany there had been much speculation about its relationship to coincidental streptococcal infection and even doubts as to the adequacy of diphtheria antitoxin in treatment. The English studies of strains of diphtheria bacilli, distinguishing *gravis*, *mitis* and *intermedius strains*, gave hope of an explanation of the enhanced virulence of the prevailing infections. Although most bacteriologists in this country currently doubt the significance of this differentiation of strains, certain English investigators still attribute significance to it. Regardless of the explanation, there was doubtless a more malignant form of diphtheria in Europe, and one might logically wonder as to the efficacy of immunization in the United States if the more malignant strains were to be introduced.

A second factor that added to the gravity of the pre-war situation in Europe was the lack of immunization. Exact data as to extent of immunization are not available. It is obvious, however, that the procedure had not become an accepted part of the public health program to the same extent as in the United States and Canada, and that

even in those countries such as Denmark, France, and Hungary where it has been used extensively, only a very small segment of the population had been reached. England had hardly been touched whereas Norway was almost completely non-immunized, the only children who had been protected being the rare child immunized by a private physician. The number of these was so small that the Norwegian authorities themselves described the country as completely non-immunized. The low incidence rates, rivalling the lowest state rate in the United States, were attributed to the efficacy of conventional restrictive measures or to other factors that had made control possible without resort to immunization.

A third element of concern was the fact that at the outset of the war, diphtheria prevailed in some parts of central Europe at a higher rate than had been experienced in this country since the preimmunization period. Exact morbidity rates are hard to determine owing to inadequacies of reporting, unknown differences in case fatality rates, and uncertainties as to population, but the data in Table 1 represent adequate approximations. The data show a high rate in central Europe and England, more moderate rates in northwestern Europe, and remarkably low rates in

TABLE 1  
*Diphtheria Morbidity Rates — 1939*  
(Per 100,000 Population)

Country	Population *	Cases	Rate
Austria	6,694,782	19,137	285
Denmark	3,835,000	1,106	29
Eire	2,980,000	2,087	70
England and Wales	41,400,000	47,698	115
France	42,000,000	14,019	33
Germany	69,485,732	143,585	207
Hungary	10,817,286	6,397	59
Netherlands	8,815,000	1,273	14
Norway	2,920,000	71	2.4
Sweden	6,340,000	188	3.0
Switzerland	4,230,000	751	18
United States	130,800,000	24,391	19

\* All populations estimated except for those of Austria, Germany, and Hungary in which a census was taken in 1939.

TABLE 2

*Diphtheria Incidence \**

	<i>Austria</i>	<i>Denmark</i>	<i>France</i>	<i>Germany</i>	<i>Hungary</i>	<i>Netherlands</i>	<i>Norway</i>	<i>Roumania</i>	<i>Sweden</i>
1937	19,494	1,348	19,187	146,733	8,148	1,068	417	3,242	299
1938	16,800	870	16,800	149,490	6,266	1,272	190	2,272	107
1939	19,137	1,106	14,019	143,585	6,397	1,273	71	2,279	188
1940	15,910	860	13,568	138,397	4,927	1,730	149	1,839	290
1941	14,255	917	20,018	173,161	5,049	5,501	2,609	1,103	252
1942	15,534	1,661	31,466	237,037	6,676	19,527	8,349	1,612	1,285
1943	22,444	2,527	46,539	238,409	8,259	56,603	22,787	1,879	2,496
1944	....	3,333	40,230	....	....	....	....	....	4,520

\* Source of data. *Epidemiological Information Bulletin*, United Nations Relief and Rehabilitation Administration. 1:241-246 (Mar. 15), 1945.

Norway and Sweden. As many of these lower rates had been achieved without resort to immunization, the population represented veritable tinder in which a conflagration might develop if the spark should spread from central Europe.

Such was the situation preceding the wartime explosion of diphtheria in northwestern Europe—a highly susceptible population already threatened on the East by a high incidence of diphtheria, much of which was of a virulent form. England alone adopted an energetic and highly successful control program through extensive immunization as a part of its civilian defense program. In 1939 France had ordered universal childhood immunization effective June 1, 1940, but France's defeat that spring had precluded enforcement of the program. Nazi conquest of Norway, Denmark, Belgium, and the Netherlands not only precluded active control measures but may even have precipitated the diphtheria outbreak through enforced malnutrition, crowding, and lack of medical supplies and services. The extent of the outbreak of diphtheria is shown in Table 2. It will be noted that Norway and the Netherlands, countries which felt the weight of the oppressor's yoke most severely, suffered the most. The disease began to increase rapidly during 1941, reaching its peak during the winter of 1943-1944. During the spring of 1944 the weekly incidence in the Netherlands was almost twice the pre-war yearly incidence. Denmark, which was possibly the best

immunized country of this area, felt the increase somewhat later than its neighbors and never suffered to the same degree. In Sweden the increase began in 1942 and was of somewhat less serious proportions. Accurate data for many of these countries for 1944 will probably never be available. In 1945 and 1946 the disease has continued throughout northwestern Europe at a high rate but very much below the 1943-1944 peak. Table 3 shows sample comparative data.

TABLE 3

*Diphtheria Incidence*

<i>Denmark</i>	<i>Oct.</i>	<i>Dec.</i>	<i>Feb.</i>
1943-4	223	390	428
1944-5	306	397	367
1945-6	153	150	116
<i>France</i>			
1943-4	4,280	5,842	4,768
1944-5	3,266	4,329	4,125
1945-6	4,259	4,164	2,765
<i>Norway</i>			
1943-4	2,982	2,519	1,505
1944-5	1,031	946	758
1945-6	570	553	291

The wartime data of the British Isles present an interesting contrast to the continental experience. Table 4 shows the incidence in war-congested England and Wales on the one hand, and in neutral Eire on the other. The former, facing the obvious risk of increasing diphtheria—a risk accentuated by displacement of the population and crowding in air-raid shelters—provided for extensive immunization; the latter did little to protect itself against an in-



crease. Whereas Eire experienced an increase from less than 2,000 cases in 1941 to over 5,000 in 1944, England and Wales enjoyed a decline to the lowest level ever recorded, a rate of decline comparable in magnitude with that of the United States during the same period (Table 4). The English data are of special significance, for this country was the only part of northwestern Europe that weathered the storm with a significant decrease in diphtheria. May it not have been more than mere coincidence that it was also the only country that increased its immunization program to a point comparable with that of the United States and Canada? The data strongly suggest that immunization is actually effective in guarding against whatever strains of infection may have been operative in Europe during the war period.

TABLE 4  
*Diphtheria Incidence \**  
Eire      England and Wales      United States

	Eire	England and Wales	United States
1937	2,511	61,341	28,536
1938	2,983	65,008	30,508
1939	2,087	47,698	24,391
1940	1,891	47,683	15,618
1941	1,447	51,091	17,310
1942	2,949	42,318	16,421
1943	4,650	35,944	14,943
1944	5,168	29,446	14,103

\* Source of data: *Epidemiological Information Bulletin*, United Nations Relief and Rehabilitation Administration. 1:241-246 (Mar. 15), 1945.

The explanation for the dramatic outbreak in northwestern Europe is not clear. Some persons have talked freely of strains of diphtheria bacilli of increased virulence. Unfortunately for this hypothesis, no one has demonstrated strains that differ in virulence from those that prevailed in this area before the war. The usual number of *gravis* strains are still being reported in England but their significance is still problematical. Furthermore, the disease as it was seen in Norway and the Netherlands was not more severe than in for-

mer years; on the contrary, the only comforting aspect of the outbreak was the fact that the prevailing form was relatively mild even though there was a shift upward in the age distribution. It is my personal belief that the most probable explanation is to be found in factors of crowding, impaired nutrition, and lack of immunization and medical care. If the level of resistance may be depressed by faulty nutrition, persons who might normally have resisted infection or become mere carriers would have developed clinically recognizable or subclinical attacks. Doull and Lara some years ago showed that, given equal opportunities for exposing other persons, cases have an infection potential some ten times that of the carrier. A slight shift in the balance of community resistance might thus precipitate a wave of infection and this wave be augmented by increased opportunities for exposure of others owing to the overcrowding incidental to wartime conditions. I cannot escape the suspicion that these demonstrable secondary factors were of greater significance than the presence of some hypothetical and still undemonstrated enhanced virulence of the prevailing strain of infection. If this be the explanation, there is little reason to fear that other countries will be menaced by this diphtheria wave. So far, at least, we have seen no evidence of such menace, and if the experience of England is any guide, we have seen evidence that immunization in its present form is an adequate measure of protection.

Coincident with these significant phenomena in western Europe there has been an equally interesting shift in the diphtheria trend in the United States and Canada. Both countries had experienced a pre-war decline in diphtheria far greater than had been observed in any other part of the world. Beginning in 1923 the United States had enjoyed an almost precipitous drop

to previously unachieved minima. Except for slight variations and momentary upsurges, this had been a constant decline, paralleling the increasing acceptance of immunization. The drop was most marked in the northern half of the country which had formerly experienced higher rates than had the South. Today by way of contrast the diphtheria rate is very significantly higher in the South, whereas the north-eastern section of the country, which for years had experienced the highest rates, has today the lowest. It is hard for me to escape the belief that this difference is not significantly related to the extent of immunization.

During the last few years, however, there has been in some places an upsurge in diphtheria that has caused some concern and even precipitated fears lest military forces returning from Europe might be introducing more virulent strains of infection. One of the earliest and most disconcerting evidences of a rise in the western hemisphere was the outbreak in Halifax in 1940-1943. While it is true that *gravis* strains were isolated here, that the age distribution tended toward older age groups, and that many of the cases were quite

severe, yet there was nothing to cast serious doubt on the efficacy of immunization or to suggest that the apparent severity of the infection was associated with the introduction of more virulent strains than already existed in North America.

In the United States the increase has not been marked by particular episodes like that in Halifax. On the contrary it has been more general over certain areas. Table 5 based on data for 52 weeks as published in the *Public Health Reports*, shows the changes in incidence over the past few years. The year 1943 represented a minimum after which there was a sharp rise in 1944 and 1945. During the first half of 1946, the incidence was higher than for the corresponding period of any of the previous three years, but during the summer the trend shifted and the weekly rates for the current fall are strikingly below those of a year ago (Table 6). The rise in 1944 and 1945 was due principally to marked increases in incidence in the South and Southwest. The present decline is marked by an incidence below that which prevailed prior to the 1944 and 1945 rise in those areas. At the same time, however, we

TABLE 5  
*Diphtheria Cases in United States*  
*Cumulative Totals by Years*

	1941	1942	1943	1944	1945	1946
13 weeks	3,826	4,037	3,769	3,212	4,020	4,938
26 weeks	6,399	6,304	6,126	5,555	6,738	8,421
39 weeks	9,879	9,374	9,063	8,406	10,749	11,436
52 weeks	17,008	15,559	13,744	14,103	18,541	....

TABLE 6  
*Current Prevalence of Diphtheria*  
*United States by Weeks*

Week	1940	1941	1942	1943	1944	1945	1946
35	185	360	248	198	205	284	193
36	227	310	321	314	239	410	221
37	249	393	349	302	301	446	273
38	336	444	385	326	325	467	295
39	307	599	448	425	352	532	313
40	432	517	550	387	409	514	351

are seeing a slight increase in rates in the North, a rise that is more than offset by the decline in the South.

These changes in incidence do not suggest changes in the character of diphtheria, nor are they suggestive of the introduction of strains of enhanced virulence. On the contrary, they probably represent the normal fluctuation in the incidence of the residual diphtheria. We have enjoyed declines in rates for so long that many persons seem to have forgotten that in the preimmunization era, diphtheria showed periodic fluctuations in incidence, with peaks spaced three to five years apart. Careful study of the declining morbidity rates reveals that the rate of decline was not constant; on the contrary it showed variations comparable to the previous periodic changes in incidence. These fluctuations were not constant throughout the nation. It is logical to believe, therefore, that the episodes of the past three years do not imply any profound or even significant change in the diphtheria problem, but rather that they represent the normal fluctuations in incidence that were formerly masked by the precipitous decline of the disease. There is no evidence that they are due to defects in immunization. On the contrary, the increases were greatest in those areas where diphtheria was already highest. The best immunized communities with the lowest rates experienced the smallest rise in incidence. Furthermore, so far as I am aware,

nowhere has there been a sharp upsurge attended by enhanced severity of the infection and isolation of an especially virulent strain of organisms.

#### SUMMARY

From the foregoing it is apparent that the past five years have witnessed an actual increase in the incidence of diphtheria. Although occurring throughout the world, the only significant episode has been that of northwestern Europe where an amazingly high rate occurred in certain occupied areas, with appreciably smaller increases in neutral countries. There is reason to believe that this was attributable to secondary epidemiological factors rather than the appearance of new virulent strains, and that it was controllable by vigorous programs of immunization. The rise in the United States during the past two years is probably an expression of the normal periodic fluctuations in incidence, fluctuations that have heretofore been largely obscured by the rapid increase in the proportion of the population that was being immunized. That this is nothing more than a transient rise is suggested by the fact that the disease is again declining rapidly in those parts of the country chiefly responsible for the rise.

There is no evidence that especially virulent strains have been introduced from Europe or that immunization is not effective against all prevailing strains.

# Rhus Dermatitis as a Public Health and Health Education Problem

C. E. TURNER, Ed.M., Sc.D., DR.P.H., F.A.P.H.A.

PUBLIC health authorities can and should secure the elimination of most of the Rhus poisoning in the United States within the next few years. The effectiveness of two new chemical herbicides, ammonium sulfamate and 2-4 dichlorophenoxyacetic acid, which have just come into use, provide the first really promising solution of this public health problem. By means of community organization through health education, the eradication of the plant in frequented areas is now readily possible.

## EXTENT OF RHUS POISONING

Rhus poisoning has received only minor attention from public health authorities, yet the U.S.P.H.S. study on the illnesses of 38,544 people shows a rate of 2.5 cases per 1,000 people annually.<sup>1</sup> Seventeen and seven-tenths per cent were bed cases and were in bed 3.6 days on the average. The mean days of disability per total case were 1.7; per bed case they were 4.9. The average total duration of the symptoms was ten days. Cases appeared in every part of the country, the crude case rate per 1,000 being 2.3 in the Northeast, 1.5 in the North Central states, 2.5 in the South, and 4.6 in the West. The numbers are too small to make these figures a reliable index of frequency, but they do show the national distribution of the plant. Of the cases 71.9 per cent were attended medically, the average number of calls per attended case being 1.93.

National estimates using these figures as a basis indicate 350,000 cases per

year, with approximately 600,000 days of lost time and 465,000 medical visits. Most cases are uncomplicated, but abscesses, enlarged glands, fever and septicemia from a secondary infection occasionally occur.<sup>15</sup>

The incidence of Rhus poisoning runs much higher among youth in localities where the plant is profusely distributed. In one student body where data were available upon about 5,000 students for a 2 year period, 6.5 students per 1,000 were hospitalized yearly for an average of 6.9 days each, representing a per capita cost of 56 cents for each student in the student body. In addition, 41 students per 1,000 sought medical aid but did not require hospitalization.<sup>2</sup> Many others treated themselves.

## POPULAR MISCONCEPTIONS

There are three widespread misunderstandings:

1. *The public thinks of poisonous forms of ivy, or oak or sumac.*

Really, of course, the plants are of only a single genus, *Rhus* or *Toxicodendron*, and perhaps of only one species. In the past over fifty species have appeared in the literature under the genus *Rhus*. They have now been given a new classification accepted by the U. S. Herbarium in Washington, D. C., under the genus name *Toxicodendron*.<sup>3</sup> The species listed in this classification are: (1) *Toxicodendron toxicodendron* (the former *Rhus toxicodendron* or *Rhus quercifolia*), (2) *Toxicodendron radicans* (eastern ivy), (3) *Toxicodendron diversilobum* (western poison oak, *Rhus lobata* or *Rhus*

*diversiloba*), (4) *Toxicodendron vernix* (swamp sumac, *Rhus vernix*, *Rhus venenata*).

The first three species were recently brought from different parts of the United States to Texas by Shelmire.<sup>4</sup> Having grown side by side they were so similar as to suggest that they are a single species with rather consistent geographic variations. Chemical and biological research indicates that the same chemical substance (urushiol) is the toxic substance in all of these plants.<sup>5</sup>

2. *It is generally believed that some individuals are so sensitive that they are poisoned if they "go anywhere near the plants."*

Studies of urushiol show it to be a dializable but nonvolatile oily resin. Soot particles in the smoke from burning plants carry enough of the substance to produce poisoning,<sup>6, 7, 15</sup> but otherwise it is not air-borne, although statements to that effect have appeared in the literature until recently.<sup>16</sup>

How is it then that it has been practically impossible for highly susceptible persons to avoid repeated poisonings? The answer lies in the fact that poisoning occurs by indirect as well as direct contact, and as little as 0.001 mg. will cause dermatitis in such persons.<sup>8</sup> The poison is transmitted indirectly by cats, dogs, horses, and other animals which walk over the plants, and also by clothing, tools, soil, and other surfaces. It is quite possible that insects may carry enough poison from broken leaves to cause dermatitis.<sup>5</sup> Naturally persons say they can get poisoned "without going outside the house," or in various apparently strange ways. This situation is similar to that which existed a century ago when even the profession regarded typhoid fever as air-borne.

The difficulty of avoiding poisoning is increased by the fact that the plant is pleomorphic. Poison oak may be a

slender, inconspicuous vine bearing leaves some distance apart, or a more conspicuous vine, or an upright stock growing out of the ground, or a bush running to almost tree-like proportions. The leaves vary in shape and the plant is often partly hidden by other plants among which it is growing. Interviews with college students who have grown up in areas where the plants are plentiful show that a large percentage of them do not recognize the plant in its various forms.

The plants are spread not only by underground roots and the fruit which is dropped to the ground, but also by seeds in the droppings of the birds which have eaten the berries.<sup>9</sup> Thus it appears in all sorts of places, in fields, in woods, in parks, in gardens and by the roadside. The writer has photographed it growing through cracks in the pavement.

It is thus the plant's toxicity, pleomorphism, and ubiquity which make poisoning extremely difficult to avoid by the highly susceptible.

3. *There is widespread confusion as to the nature of susceptibility and "immunity."*

The idea that some persons have a true, natural immunity is wrong. It is believed that we are dealing with allergy and desensitization rather than with a true immunity, natural or acquired.

"All observers believe that the typical dermatitis is the result of contact after previous exposure and sensitization to the active substance in the plants. Infants, adults, and certain animals have been sensitized with the plant extracts or with urushiol. There is also some evidence that this sensitization resulting from either experimental or natural contact diminishes in intensity if not maintained by repeated exposure."<sup>5</sup>

Some persons have a marked resistance to the action of the poison,

although their skin becomes inflamed upon prolonged exposure to urushiol. Such a person may have had repeated contact with the plant without symptoms, only to develop a severe poisoning upon a subsequent exposure.<sup>10</sup> Medical authorities have warned against the practice of chewing leaves in an attempt to produce immunity, because the practice does not give protection but often produces symptoms.

#### PREVENTIVE PROCEDURES

Attempts to teach children and the general public to recognize and avoid these plants could be carried farther but to date, as we have seen, it has been relatively ineffective. Prevention or early treatment by prolonged washing with alkaline soap or a chemical agent for removing the poisoning is effective only if undertaken "within a few minutes after contact."<sup>9</sup> The victims often do not know when they have been exposed, and urushiol on the skin is invisible. After the area reddens and begins to itch "any treatment now known will serve only to make the patient more comfortable; it will do little to hasten recovery," according to some authorities.<sup>9</sup> However, the Boy Scouts of America report good results from experience in many parts of the country in treating vesicular eruptions with 10 per cent tannic acid solution as recommended by Schwartz and Warren.<sup>17</sup> Many people claim great benefit from one or another of the many suggested remedies, but none appears consistently beneficial for different individuals or even for the same individual.<sup>15</sup> Clothing or tools can be decontaminated by immersing them for 15 or 20 minutes in 1 per cent solution of calcium hypochlorite, but the practice is little followed.

The failure of these hygienic measures has led to widespread attempts at desensitization, but this too has proved far from satisfactory. "The Council of

Pharmacy and Chemistry admitted rhus preparations to *New and Nonofficial Remedies* in 1926, but since then there has been a growing controversy regarding the real value of rhus preparations."<sup>5</sup> There is some evidence that the ingestion of extracts over a period of 6 weeks or less can produce temporary desensitization if the doses are so large as to cause rashes and gastrointestinal symptoms, but the Council states<sup>5</sup> that "there is no controlled statistical evidence that the daily ingestion of small amounts of extract over a long period will modify the dermal test or give protection, and the ingestion of large doses within a period of a few months is still experimental." Moreover, this intensive treatment is probably unsafe except under experienced supervision.

There is some clinical evidence that intramuscular inoculation has conferred temporary resistance, but the patch test was not modified in these studies and the inoculated subjects were not vigorously exposed to poison after the inoculation.<sup>5</sup>

Preventive treatment with ivy extracts thus seems far from satisfactory. The effectiveness is uncertain and the process is uncomfortable as well as expensive for the individual. Even if it were effective, the preventive treatment would have to be continued year after year because desensitization is only temporary, when it does occur.

Our unsatisfactory experience in preventive hygiene and preventive medicine turns our attention to environmental control, where we now have for the first time some promise of success. Earlier attempts to kill the plants or dig them out were unsuccessful but the new chemicals kill the plants, root and all. You may feel that it is hopeless to attempt to eradicate the plant immediately over millions of acres of land. Complete eradication at once is not necessary. The poison is not air-borne

and the cheapness of some of the chemical herbicides makes it possible to eradicate the plant near dwellings and in other frequented areas like roadways, parks, and cultivated lands, even if the growth is fairly extensive.

#### CHEMICAL AGENTS

With ammonium sulfamate or "Ammate" and 2,4-dichlorophenoxyacetic acid, or 2,4-D, commercial companies engaged in weed control are now ready to guarantee the complete eradication of poison ivy or poison oak.

Ammonium sulfamate is not explosive or poisonous to animals, and it is now available in a form which is not corrosive to metals. It is highly effective and can be used later in the season than 2,4-D. It kills other plants. Grass tops are killed but the grass will usually come up from the roots. It is rather expensive, costing about 30 cents a pound at retail and 15 cents a pound in larger quantities. About one pound is needed in making a gallon of spray. A heavy growth of poison ivy or poison oak would require from 100 to 300 gallons of spray per acre.

2,4-D is a hormone-like chemical which in small quantities stimulates growth but kills active broad-leaved plants completely when applied to the leaves in greater concentration. Some respraying of missed plants after a month, and a yearly spring check-up will be needed. But when the plant is eradicated in frequented areas, the seeding of new plants will be limited.

The early research on this substance was by Pokorney<sup>18</sup> and by Zimmerman and Hitchcock,<sup>12</sup> in 1941 and 1942. The methods of using it for killing plants were developed by Jones,<sup>19</sup> Mitchell and Hamner,<sup>13</sup> and others. Wide uses are being found for its weed-killing action.<sup>10</sup> It seems likely to prove of public health significance in the elimination of ragweed as well as poison ivy. Ragweed is among the more sensitive of the

common weeds and considerable success has been achieved in preventing pollen formation by the use of low dilution of 2,4-D as a water spray and also in the form of a fog.<sup>14</sup>

2,4-D is relatively inexpensive. The spray can be made for 8' to 12 cents per gallon in small quantity and for as little as \$3 to \$4 per 100 gallons. It is not a fire hazard nor is it corrosive to metals or irritating to the skin or poisonous to man or other animals.<sup>11</sup> It does not kill grass in the concentration used but it does kill many broad-leaved plants besides poison ivy. These qualities make 2,4-D more practical than ammate for use in large areas.

Many chemical companies manufacture 2,4-D compounds under various trade names. These weed killers vary in price, in concentration, and in the nature of the chemical compound, which may be the dichlorophenoxyacetic acid as such or the ammonium salt, the sodium salt, the triethanolamine salt, or the methyl, ethyl, or butyl ester. We have little data on their relative effectiveness. 2,4-D is most effective on poison ivy around the end of the growing season. Moist soil and sunlight seem to add to its effectiveness. It always acts slowly, requiring about a month to produce killing action.<sup>11</sup>

The following precautions should be advocated in advising the use of 2,4-D:

1. Be sure the chemical is well mixed in the correct concentration.

2. Spray when the leaves are well developed, giving a large surface. (2,4-D is not effective late in the season when the plant has become dormant.)

3. Spray the whole plant and cover the leaf surfaces as completely as possible, but be careful that the drift of the spray does not wet flowering plants or fruit trees. (Neither moisture on the leaves, nor rain four or more hours after spraying will prevent the killing action of the spray.)

4. If a few plants have survived, kill them by spraying a second time in three or four weeks.

5. Examine the area the next spring and kill any new plants which may have come up from seed.

6. Clean spraying equipment thoroughly before using other sprays on cultivated plants.

#### GETTING RESULTS

Eradicating rhus plants with 2,4-D is not a completely simple and foolproof procedure. Obvious difficulties appear when any one of the above directions is not carried out correctly. But real progress can be made through community organization and health education.

An effective community organization was developed in Berkeley, Calif., in the spring of 1946, thanks to an alert Chief of the Park Division, Charles Cresswell; a progressive Health Officer, Dr. Frank Kelley; and an interest on the part of university personnel. It showed clearly that community interest and educational activities can be made effective.

The county medical society and the local dental association joined the project at the beginning. A demonstration of killing poison oak with 2,4-D was carried out on the university campus, the success of which was recorded in still and in moving pictures. The student body put on an educational program of its own, as did the public schools. Twenty-five thousand "stuffers" were sent to citizens with monthly bills from the city and from public utilities. The press, the local radio station, the Boy Scouts, the service clubs, the women's clubs, and commercial interests all participated. As a result an extensive spraying program got under way in local and regional parks, on university grounds, along the roadsides, and on the private property of many scores of individual citizens. There is an ordinance providing that the city can kill noxious weeds on privately owned land and charge the cost to the property owner. This may prove valuable if some citizens

fail to act under the stimulus of education.

#### FUTURE PROGRESS

Facts and experience now available show that plant eradication is a practical means of attacking the problem of rhus dermatitis. We still need studies on the relative effectiveness of the different commercial products and the best methods of using them. A study should be made to show how rapidly and to what extent urushiol disappears from the resin cells or resin canals of the bark, roots, stems, and leaves after the plant has been killed. It loses its toxicity upon oxidation and the plant contains an enzyme, laccase, which oxidizes the poison when the plant is injured and its juices exposed to air.<sup>5</sup> Preliminary tests have indicated that the dry, dead plants are much less dangerous than the live plants.

These studies and others will be forthcoming from commercial agencies and from governmental agencies in agriculture and in health. Patterns for community organization need further development. One national agency which is considering ways of effective action and which could render a most important service is the Boy Scouts of America. Park departments and recreation agencies can be counted on for effective action as can the wide variety of agencies with civic interests. We can prevent a quarter million cases of ivy poisoning a year—some of them very serious—if we use the necessary leadership and effort.

#### SUMMARY AND CONCLUSIONS

1. Preventive hygiene and attempted desensitization have not proved effective in preventing rhus dermatitis.

2. Eradicating the plants in frequented areas by means of 2,4-D or ammonium sulfamate provides a practical means of prevention.

3. Effective community organization for



health education in the eradication of poison oak has been demonstrated.

4. Health department leadership and the coöperative efforts of community agencies can reduce the now prevalent dermatitis to a relatively rare illness.

#### REFERENCES

1. Collins, Selwyn D. Duration of Illness from Specific Diseases among 9,000 Families Based on Nationwide, Periodic Canvass, 1928-31. *Pub. Health Rep.*, 55:20 (May 17), 1940.
2. *California's Health*. Facts about Poison Oak. June 30, 1946.
3. Spain, W. M. *J. Immunol.*, 7:179, 1922.
4. Shelmire, B. *J. Invest. Dermat.*, 4:337, 1941.
5. Council on Pharmacy and Chemistry. Report on the Status of Poison Ivy Extracts. *J.A.M.A.*, 127:14 (Apr. 7), 1945.
6. McNair, J. B. *Am. J. Botany*, 8:242, 1921.
7. von Adelung, E. An Experimental Study of Poison Oak. *Arch. Int. Med.*, 11:148 (Feb.), 1913.
8. Stevens, A. B., and Warren, L. E. *Am. J. Pharm.*, 79:499, 1907.
9. Harlow, W. M. Poison Ivy and Poison Sumac. New York State College of Forestry *Bulletin*, Syracuse University, 1946.
10. United States Public Health Service. Schwarz, L., Dunn, J. E., and Goldman, F. H. Ivy and Sumac Poisoning. Suppl. 161, *Pub. Health Rep.*, 1940.
11. Hildebrand, E. M. War on Weeds. *Science*, 103:2677:465-468 (Apr. 19), 1946. In the same issue see also "Plant Growth Regulators" by the Special Projects Division, Chemical Warfare Service, pp. 469-470 and "Technical Papers" pp. 472-479, and Bibliography.
12. Zimmerman, P. W., and Hitchcock, A. E. Contr. Boyce Thompson Inst., 12:321-344, 1942.
13. Mitchell, J. W., and Hamner, C. L. *Bot. Gaz.*, 105:474-483, 1944.
14. Smith, F. G., Hamner, C. L., and Carlson R. F. Control of Ragweed Pollen Production with 2,4-Dichlorophenoxyacetic Acid. *Science*, 103:2677 (Apr. 19), 1946.
15. U. S. Dept. of Agriculture. Crooks, D. M., and Kephart, L. W. Poison Ivy, Poison Oak and Poison Sumac. *Farmers' Bull.*, 1972:1-30, 1945.
16. Dermatitis Venata, Queries and Minor Notes. *J.A.M.A.*, 102:1517 (May 5), 1934.
17. Schwartz, Louis, and Warren, Leon H. Tannic Acid Treatment of Poison Ivy Dermatitis. *Health and Safety* (Boy Scouts of America), Vol. 6, No. 4 (Aug.), 1941.
18. Pokorney, C. F. *J. Am. Chem. Soc.*, 63:1786 (June), 1941.
19. Cates, J. S. A Knockout for Weeds. *Country Gentleman*, Jan., 1945.

# The Present Status of the Control of Air-borne Infections\*

FOR several decades prior to 1934 it was generally believed that the acute respiratory and contagious diseases were spread largely by contact.<sup>1, 2</sup> Since that time, however, it has been clearly established that the air of enclosed spaces may become heavily contaminated with a variety of pathogenic microorganisms, and that certain specific infections may be transmitted to experimental animals by the aerial route.<sup>3-11</sup> These observations have led many students to question the predominant rôle of contact in the spread of infection and to undertake investigations in the attempt to control disease by the application of engineering methods to the disinfection of air (sanitary ventilation) and to the prevention of aerial contamination (dust suppression).<sup>12-17</sup>

Numerous reviews of the subject have been published in scientific journals,<sup>18-25</sup> and optimistic but frequently uncritical stories of the potentialities of the field have reached the commercial and lay press. The purpose of this report is not primarily to present an additional review of recent progress but rather to give a critical evaluation of the present status and limitations of existing methods. Such an evaluation depends not only upon the engineering aspects of air sanitation but also on the epidemiological evidence supporting the concept of air-borne infection.

## DEFINITION OF TERMS

Some confusion has arisen in the discussion of the subject because of the lack of a clear definition of terms. In the present report, the term *sanitary ventilation* will be used to connote the disinfection of air by actual ventilation or its equivalent through such methods as ultra-violet irradiation or germicidal vapors. The term *air sanitation* will include all types of applications of engineering methods to the prevention and removal of air contaminants such as dust, bacteria, and other noxious agents.

There is need also for a clarification of the term "air-borne infection." This expression has been applied to a number of respiratory and contagious diseases and to secondary skin and wound infections which are known to be spread, at least in part, by contact. A practical delineation of meaning of the terms "contact" and "air-borne" is desirable.

The routes by which these types of infectious agents travel from one individual to another may be classified under four general headings:

1. *Contact*, transmission directly, as in kissing, or indirectly by contaminated hands, toys, surgical instruments, or other material objects.

2. *Droplets*, transmission directly by projection onto the conjunctivae, mouth, skin, or open wounds.

3. *Droplet nuclei*, transmission indirectly by inhalation of the small residues which result from evaporation of droplets, and which may remain suspended in the air of enclosed spaces for long periods of time.

4. *Dust*, transmission indirectly by inhalation or settling of larger particles

\* Report of the Subcommittee for the Evaluation of Methods to Control Air-borne Infections, of the Committee on Research and Standards.

Organized 1945. First report: Presented before the Epidemiology Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 14, 1946.

which arise from secondary reservoirs of infection on floors, clothes, or bedding, and which remain suspended in air for short periods of time.

The spread of infection by contact or by droplets is subject to control by methods which influence human behavior or restrict individual activity, such as the promotion of personal hygiene, isolation, quarantine, aseptic techniques, and barrier nursing. The spread of infection by droplet nuclei and dust is an environmental problem amenable to attack by methods of air sanitation.

Confusion arises in regard to the rôle which should be ascribed to droplets. Although these actually travel short distances through the air, it has been traditional to consider them as an intrinsic aspect of contact infection.<sup>1</sup> Furthermore, droplets are not affected appreciably by any of the devices of sanitary ventilation which have yet been developed. In the present discussion, therefore, the term "contact" will be considered to include droplets, and the term "air-borne" will be restricted to transmission of infection by droplet nuclei and dust.

#### GENERAL CONSIDERATIONS

On the basis of this definition, the technical aspects of the problem will be limited to an evaluation of the present status of the devices of air sanitation. Broader aspects of the problem must also be considered. It is necessary to know the true relative importance of air-borne and contact spread of disease under a wide variety of environmental conditions. The disinfection of air can be of practical value only in situations where the aerial route of infection is important in the mode of transmission.

Other considerations beyond the scope of the present report cannot be wholly ignored. The methods of air sanitation are in competition with other control measures. Aseptic techniques

and isolation precautions are well established procedures in operating rooms and hospital wards. Immunization has been highly successful in certain specific diseases. Chemoprophylaxis may have limited applications. Therapy with sulfonamide drugs and antibiotics reduces in large measure the serious consequences of many bacterial infections. The future of air sanitation in the prevention of disease depends upon the demonstration of its practical superiority to other approaches to the problem.

#### PRESENT STATUS OF CONTROL METHODS

The methods of controlling air-borne infection have developed in four principal directions: (1) mechanical ventilation, (2) ultra-violet irradiation, (3) disinfectant vapors, and (4) dust suppression. In developing these procedures, the usual criteria of effectiveness have been the reduction: (1) of test organisms added to air, (2) of the total bacterial count of air, (3) of certain microorganisms usually found in the nasopharyngeal tract, and (4) of certain specific pathogens such as beta hemolytic streptococci or influenza virus A. While bacteriological criteria have been of great practical value in the development of the procedures, they are insufficient. The final criterion of effectiveness must be the demonstration of a significant reduction in the incidence of disease in well controlled studies in human populations living under natural conditions.

*Ventilation* — Simple ventilation by means of open windows has been a common hygienic practice for many years. Its use has been traditional in military barracks where it has been notable for its unpopularity among troops and the difficulty of its consistent enforcement. British workers have recently reëmphasized the desirability of open window ventilation in contagious disease wards.<sup>26</sup> Although it

is probable that such measures may have considerable effect in reducing the bacterial contamination of the air, they are obviously expedients of limited value which are subject to variable climatic conditions and which may cause extreme discomfort.

Under certain specialized conditions, the control of air currents and air conditioning either alone or in conjunction with physical barriers and other procedures has been applied with somewhat variable success to the control of cross-infections in surgical dressing rooms,<sup>27</sup> in pediatric and premature infant wards,<sup>15, 28-31</sup> and in animal colonies and laboratories of research institutions.<sup>32, 33</sup> Under more general conditions, however, the purification of air through washing, filtration, and forced ventilation is a relatively inefficient method of reducing the bacterial content of air in occupied spaces.<sup>34</sup> Normal human activity maintains a continuous source of contamination which is difficult to eliminate by economical rates of air dilution. Nevertheless, a careful consideration of temperature, relative humidity, air currents, and rates of introduction of outside or recirculated air is fundamental to the effective application of the other more efficient means of air disinfection.

*Ultra-violet irradiation*—The bactericidal action of ultra-violet light is well established and accurately defined.<sup>24, 35-40</sup> The effectiveness decreases rapidly with increasing relative humidities above 55 or 60 per cent. The rays are more efficient against small particles, such as droplet nuclei, than large particles, such as dust and lint, in which microorganisms may have a protective coating impermeable to the bactericidal rays. Since germicidal intensities are damaging to the human skin and conjunctivae, radiation must be restricted to the upper air or to carefully placed light screens or barriers at the entrance to rooms or to isolation

cubicles.<sup>41</sup> Under standardized test conditions practical intensities of ultra-violet light have been shown to have a marked effect in lowering the bacterial contamination of the air equivalent to 100 or more air changes an hour.<sup>42</sup> Under field conditions, this degree of effectiveness is not always reached; but, nevertheless, a pronounced effect may be induced.

The development of the low pressure mercury vapor tube, of carefully designed fixtures, and of accurate photometers to measure intensity makes possible the safe and reasonably economical installation of ultra-violet lights in a variety of circumstances. Each particular environmental situation, however, presents a specialized problem which requires the expert consultation and continued supervision of ventilation and irradiation engineers.<sup>24</sup>

The use of ultra-violet irradiation in the control of infection has been undertaken in operating rooms, in pediatric and contagious disease wards, in schools, in military barracks, and in children's institutions. The most impressive results have been reported from operating rooms.<sup>14, 43</sup> The residual contamination of the air which remains even after the most rigid aseptic precautions can be greatly reduced by intensive irradiation. Reports indicate substantial reductions in the incidence of secondary infections of originally clean operative wounds. To achieve such results, with early installations it appeared to be necessary to take extreme precautions to protect the operating personnel; but improved designs have made such precautions unnecessary.<sup>43</sup>

Ultra-violet irradiation of the upper air and the use of light screens in front of cubicles and in entryways to pediatric and contagious disease wards have been employed in a number of institutions. Rather dramatic results have been reported by a number of workers in carefully controlled experiments.<sup>15, 31, 44</sup>

Negative results have been reported by others.<sup>45-47</sup> It is difficult to evaluate these because of (1) inadequate information regarding the efficiency of the installations; (2) the lack of a sufficient number of controlled observations; and (3) the problem of distinguishing which infections were air-borne and which may have resulted from contact.

Irradiation of the upper air of schoolrooms in Swarthmore and Germantown, Pa., has been carried out continuously since 1937.<sup>13, 48, 49</sup> During the early part of this period, two epidemics of measles were apparently prevented among children in the primary grades whose rooms were irradiated, although large epidemics occurred among the less susceptible children in the secondary grades whose rooms were not irradiated. Beneficial effects in the reduction of the incidence of chicken pox have also been reported, although the procedure was less successful in controlling an epidemic of mumps which occurred in the early fall of 1941 when relative humidities were high.

The application of ultra-violet rays in the schoolrooms provides a very valuable approach to studying the importance of air-borne spread of infection, but the extent to which this procedure should be applied generally is uncertain. More extensive studies, now in progress, should add materially to our understanding of the problem.

Irradiation of the upper air, of the corridors, and of the floors of the naval barracks at Camp Sampson, New York, was investigated during the winter of 1943-1944.<sup>50</sup> In one group which received high intensity irradiation, there was a 25 per cent lower incidence of "respiratory admissions" than among comparable groups of controls. These studies have been continued and extended, but results have not yet been reported.

One study of ultra-violet irradiation has been conducted in the restricted

population of an institution for delinquent adolescents in Washington, D.C.<sup>51</sup> No reduction in the incidence of respiratory disease was demonstrable over a period of two years, but the total incidence rates were generally so low that a measurable effect could hardly have been anticipated.

These studies suggest that ultra-violet irradiation has its most direct application in specialized situations where the incidence of cross-infection is high, where the consequences of such infections are serious, and where the population is strictly regimented, as in operating rooms, pediatric hospitals, and analogous situations. However, the evidence, at present available, is insufficient to warrant the use of ultra-violet lights in more general population groups except in well controlled research studies.

*Disinfectant vapors*—Numerous vapors have been shown under experimental conditions to have a powerful bactericidal effect in air. Among these are hypochlorous acid gas,<sup>52</sup> lactic acid,<sup>53</sup> iodine,<sup>54</sup> and certain glycols.<sup>16, 21, 55, 56</sup> Triethylene glycol appears to be the most adaptable for general use because of its high bactericidal potency, its reasonable cost, and its freedom from odors, toxicity, and corrosiveness to metal surfaces. The mechanism of action of this vapor has been carefully studied.<sup>57</sup> Its bactericidal effect depends upon its relative saturation in the air rather than upon the total concentration. Under laboratory conditions the vapor is most effective at relative humidities between 30 and 55 per cent. On hospital wards, however, effective bactericidal action was obtained at relative humidities as low as 18 per cent.<sup>58</sup> Methods for vaporizing triethylene glycol into the air and for maintaining its relative saturation at a constant level have been developed on an experimental basis and give promise for being standardized for practical purposes.<sup>57, 59</sup>

Glycol vapors are more effective

against small particles or droplet nuclei in the atmosphere than they are against larger dust particles.<sup>60</sup> The most effective reduction in bacterial contamination has been observed when glycol vapors have been used in conjunction with dust suppressive measures.<sup>61</sup>

Studies of the effect of glycol vapors in the control of respiratory infections have been conducted in isolation wards of army hospitals,<sup>61, 62</sup> in barracks,<sup>63, 64</sup> and in a home for crippled children.<sup>65</sup> Most of these studies, however, were undertaken prior to the development of accurately standardized methods for maintaining the concentration of vapors at a bactericidal level. Observations have not been continued for sufficient periods nor have controls been adequate to provide conclusive evidence.

The use of glycols has one distinct advantage over ultra-violet irradiation in that the vapor may permeate all parts of the room and is not restricted to the upper air. There are, however, a number of technical problems which remain to be solved, among which are practical methods of vaporization and maintenance of an adequate and even distribution of bactericidal concentrations of vapor.<sup>66</sup>

*Dust suppression*—The application of light paraffin or spindle oil to the floors of military barracks and army hospital wards has been shown to be a simple and effective procedure for laying dust and thereby reducing the bacterial contamination of the air resulting from sweeping or other activity.<sup>67</sup> A saturation dose of oil to unvarnished soft wood floors remains effective for a period of three months or longer. More frequent treatments may be necessary for hardwood floors. The procedure cannot be used for concrete, linoleum, or waxed surfaces, but the daily use of oiled sawdust or oiled mops during sweeping is quite effective.

Numerous methods have been developed for the oil impregnation of

blankets, bedding, and certain types of clothing.<sup>68-73</sup> Treated fabrics show marked dust and bacteria holding properties. Recently, a simple method has been developed which can be applied as a routine procedure in any modern well equipped laundry.<sup>72</sup> A stable oil in water emulsion, made with a neutral detergent, Triton N.E., is added at the time of the final rinse in the laundering process. After such treatment, woollen fabrics such as blankets retain their dust and bacteria holding properties for many months, even after subsequent washing.

A few controlled studies of the effect of dust suppressive measures on the incidence of respiratory disease have been carried out. A marked reduction in the incidence of beta hemolytic streptococcal cross-infections was observed in one measles ward compared with an untreated adjacent ward to which alternate cases were admitted.<sup>17</sup> At Fort Bragg, N. C., during the winter of 1944-1945, four battalions of recruits (2,000-4,000 men) were observed over a period of 6 months.<sup>74</sup> In the barracks of alternate batteries floors and blankets, sheets, pillow cases, and mattress covers were oil-treated. During November and December when respiratory diseases were endemic, somewhat lower rates were observed in the treated groups. During the 4 month period from January to April, however, when undifferentiated acute respiratory disease was epidemic, no difference in incidence between test and control groups was observed. In this experiment the incidence of beta hemolytic streptococcal infections was too low to test the effect of the procedures on this group of diseases.

The oiling of floors and bedding has been developed to the stage of practical application. These methods are particularly useful for the maintenance of general cleanliness; they result in a marked reduction in the degree of bacterial contamination of the air; they

can be recommended for use as general hygienic measures; but there is insufficient evidence at the present time to establish their value in the control of respiratory diseases.

#### EPIDEMIOLOGICAL CONSIDERATIONS

The limiting factor in the evaluation of the effectiveness of measures to control air-borne infection is the lack of sufficiently extensive experimental and epidemiological observations to determine the true relative importance of this mode of spread. The available data can be grouped under three broad headings: (1) Experimental demonstrations of air-borne infection, (2) descriptive field observations, and (3) controlled studies. Each of these will be discussed briefly.

*Experimental demonstrations*—A limited number of infections have been transmitted to animals and to man by the air-borne route under strictly controlled conditions. Examples of these experiments are the transmission of tuberculosis to rabbits,<sup>11</sup> of influenza A and B to mice and ferrets,<sup>4, 75-77</sup> of canine distemper to ferrets and dogs,<sup>78</sup> and of poliomyelitis to monkeys.<sup>79</sup> During the direct inoculation of volunteers with the viruses of measles<sup>80</sup> and atypical pneumonia,<sup>81</sup> cross-infections were observed among uninoculated individuals under conditions which strongly suggested the air-borne route of infection. These observations clearly demonstrate that certain infectious agents may be acquired by inhalation in sufficient doses to produce clinical disease.

*Descriptive field observations* — In most epidemics of respiratory and contagious diseases which occur in nature, it is not possible to distinguish between contact, droplets, and air-borne methods of transmission. In certain laboratory epidemics, however, conditions have precluded any other means of spread than the air. This is particularly true for psittacosis<sup>82</sup> and Q fever,<sup>83, 84</sup> and it

also probably applies to a number of bacterial, rickettsial, and viral infections which are known to be peculiarly dangerous to laboratory workers or which are difficult to exclude from animal colonies.

The occurrence of cross-infections in communicable disease wards and of secondary infections in clean surgical wounds was formerly considered to be *a priori* evidence of faulty technique. The consistency with which a residual number of such infections have continued to occur, however, in spite of the most rigid precautions favors the concept of air-borne spread.<sup>22</sup> The demonstration of large secondary reservoirs of beta hemolytic streptococci, of diphtheria bacilli, of staphylococci and other pus forming organisms in the environment, and in the dust surrounding patients also supports strongly the possibility of air-borne transmission. It should be emphasized, however, that under such conditions the likelihood of contact infection is also greatly increased, and it is difficult to ascertain the relative importance of these two modes of spread.

*Controlled studies*—As yet, an insufficient number of adequately controlled studies have been reported upon which to base any general conclusions. Only certain tentative indications may be outlined at the present time. For example, the reduction in the incidence of operative wound infections and of cross-infections in pediatric and communicable disease wards and of measles in certain schools by the use of ultra-violet irradiation suggests that air-borne transmission, particularly by droplet nuclei, played an important rôle under the particular conditions of those experiments. Similarly it is reasonable to conclude that droplet nuclei were of some importance in the transmission of acute respiratory diseases in the naval barracks at Camp Sampson. On the other hand, an equally logical conclusion can be drawn

from the studies at Fort Bragg that dust was an unimportant factor in the spread of the epidemic acute respiratory disease prevalent at that post. Furthermore, the spectacular results which followed the introduction of aseptic surgery and isolation techniques thirty to fifty years ago indicate the importance of contact infection in operating rooms and hospital wards.

Conclusive evidence is not available at present that the air-borne mode of transmission of infection is predominant for any particular disease. There is no justification for the conclusion that the traditional methods of controlling contact infection can be ignored or relaxed.

There is need for more precise knowledge regarding the epidemiology of acute infectious diseases in crowded populations. For example, recruits in military training camps generally experience an unusually high incidence of acute respiratory disease and atypical pneumonia during winter months.<sup>85</sup> During the war years, devastating epidemics of beta hemolytic streptococcal infections and acute rheumatic fever occurred in certain camps.<sup>86-89</sup> The value of air sanitation for controlling these epidemics depends upon the extent to which the infections may be air-borne. The conduct of controlled studies using various techniques of disinfecting air and suppressing dust is one of the few means of answering this question.

#### CONCLUSIONS

The subcommittee offers the following five points to summarize its group judgment concerning the present status of the application of engineering methods to control air-borne infection:

1. The oiling of floors, blankets, and bedding has now developed to the point of practical application in the suppression of dust. Such measures constitute good housekeeping. They reduce bacterial contamination of the air, but there is as yet insufficient evidence that they prevent disease. Dust suppression should be applied wherever practicable in conjunction

with ventilation, ultra-violet irradiation, and disinfectant vapors, when the latter methods are employed.

2. The available evidence strongly indicates that methods of air disinfection (ventilation, ultra-violet irradiation, and glycol vapors) are useful adjuvants to aseptic techniques in the reduction or elimination of air-borne infections in operating rooms and in contagious disease and pediatric wards. Installations are indicated under conditions where there has been demonstrated or there exists potentially a significant incidence of cross-infection or a serious risk to patients. It is essential that competent engineering supervision be available to insure the adequacy of the original installation, to maintain its continued effectiveness, and to protect both personnel and patients.

3. It is not yet possible to compare the relative efficiency of ultra-violet irradiation and glycol vapors. Only the former method has been developed to a point of practical application. Recent designs of glycol vaporizers and automatic control devices give promise that adequately controlled studies may be conducted in the near future. The relative merits of the two procedures will involve such problems as cost, safety, and the consistency of effective operation based upon long experience.

4. The general use of ultra-violet irradiation or disinfectant vapors in schools, barracks, and in specialized industrial environments is not justified at the present time. There is great need for further carefully controlled field studies to define the mechanisms of the spread of infectious disease among these types of populations.

5. There is no justification for the indiscriminate use of ultra-violet light or other methods for disinfecting air in homes, offices, or places of public congregation.

#### REFERENCES

1. Chapin, C. V. *Sources and Modes of Infection* Wiley, New York (2nd ed. rev.), 1916.
2. Chapin, C. V. The Relative Importance of Aerial and Contact Infection. *Trans. 15th Int. Cong. Hyg. and Demog.*, 4:9-17, 1913.
3. Wells, W. F. Air-borne Infection: II. Droplets and Droplet Nuclei. *Am. J. Hyg.*, 20:611-618, 1934.
4. Wells, W. F., and Brown, H. W. Recovery of Influenza Virus Suspended in Air and Its Destruction by Ultra-violet Irradiation. *Am. J. Hyg.*, 24:407-413, 1936.
5. White, E. On the Possible Transmission of Hemolytic Streptococci by Dust. *Lancet*, i:941-944, 1936.
6. Allison, V. D., and Brown, W. A. Reinfection as a Cause of Complications and Relapses in Scarlet Fever Wards. *J. Hyg.*, 37:153-171, 1937.
7. Cruickshank, R., and Godber, G. E. The Aerial Spread of Streptococcal Infections. *Lancet*, i:741-746, 1939.



8. Wright, H. D., Shone, H. R., and Tucker, J. R. Cross-Infection in Diphtheria Wards. *J. Path. & Bact.*, 52:111-128, 1941.
9. Willits, R. E., and Hare, R. The Mechanism of Cross Infection of Wounds in Hospitals by Hemolytic Streptococci. *Canad. M. A. J.*, 45:479-488, 1941.
10. Hamburger, M., Jr., Puck, T. T., Hamburger, V. G., and Johnson, M. A. Studies on the Transmission of Hemolytic Streptococcus Infections. III. Hemolytic Streptococci in the Air, Floor Dust, and Bedclothing of Hospital Wards and Their Relation to Cross Infection. *J. Infect. Dis.*, 75:79-94, 1944.
11. Lurie, M. B. Experimental Epidemiology of Tuberculosis; Prevention of Natural Air-borne Contagion of Tuberculosis in Rabbits by Ultra-violet Irradiation. *J. Exper. Med.*, 79:559-572, 1944.
12. Trillat, A. Les aerosols microbiens: applications (1). *Bull. Acad. de med.*, 3rd Series, 119:64-74, 1938.
13. Wells, W. F., Wells, M. W., and Wilder, T. S. The Environmental Control of Epidemic Contagion. I. An Epidemiologic Study of Radiant Disinfection of Air in Day Schools. *Am. J. Hyg.*, 35:97-121, 1942.
14. Hart, Deryl. The Importance of Air-borne Pathogenic Bacteria in the Operating Room: A Method of Control by Sterilization of the Air with Ultra-violet Radiation. *Aerobiology*, Amer. Ass. Adv. Sci., 1942, pp. 186-192.
15. Rosenstern, I. Observations on the Control of Respiratory Contagion in the Cradle. *Aerobiology*, Amer. Ass. Adv. Sci., 1942, pp. 242-250.
16. Robertson, O. H., Hamburger, M., Jr., Loosli, C. G., Puck, T. T., Lemon, H. M., and Wise, H. A Study of the Nature and Control of Air-borne Infection in Army Camps. *J.A.M.A.*, 126:993-999, 1944.
17. Wright, J., Cruickshank, R., and Gunn, W. Control of Dust-borne Streptococcal Infection in Measles Wards. *Brit. M. J.*, 1:611-614, 1944.
18. *Aerobiology*. Amer. Ass. Adv. Sci., Washington, D. C., 1942.
19. Symposium on Air-borne Infection, Soc. Am. Bact., May 3, 1944. *Am. J. M. Sc.*, 209:54-78, 152-180, 1945.
20. Andrews, C. H. Control of Air-borne Infections in Air-raid Shelters and Elsewhere. *Lancet*, ii:770-774, 1940.
21. Robertson, O. H. Air-borne Infection. *Science*, 97:495-502, 1943.
22. Cruickshank, Robert. Hospital Infection: A Historical Review. *Brit. M. Bull.*, 2:272-276, 1944.
23. Perkins, J. E. Evaluation of Methods to Control Air-borne Infections. *A.J.P.H.*, 35:891-897, 1945.
24. Coblentz, W. W. Ultra-violet Lamps for Disinfecting Purposes. Present Status. *J.A.M.A.*, 129:1166-1167, 1945.
25. Hare, R., and Mackenzie, D. M. The Source and Transmission of Nasopharyngeal Infections Due to Certain Bacteria and Viruses. *Brit. M. J.*, i:865-870, 1946.
26. Allison, V. D., Bourdillon, R. B., Craig, W. S., Crooks, J., Crosbie, W., Gaisford, W., Gunn, W., Lightwood, R., Spence, J. C., Vining, C. W., and Watkins, A. G. Cross Infections in Children's Wards. *Brit. M. J.*, i:673-677, 1946.
27. Bourdillon, R. B., and Colebrook, L. Air Hygiene in Dressing-Rooms for Burns or Major Wounds. *Lancet*, i:561-565, 601-605, 1946.
28. Blackfan, K. D., and Yaglou, C. P. The Premature Infant; A Study of the Effects of Atmospheric Conditions on Growth and on Development. *Am. J. Dis. Child.*, 46:1175-1236, 1933.
29. Chapple, C. C. The Controlled Physical Environment for the Premature and Older Infant. *Aerobiology*, Amer. Ass. Adv. Sci., 1942, pp. 251-253.
30. Reyniers, J. A. The Control of Cross Infection by the Use of Mechanical Barriers. I. Principles and Instrumentation for Absolute and Partial Control with Fixed and Circulating Hosts. *Aerobiology*, Amer. Ass. Adv. Sci., 1942, pp. 254-259.
31. Robertson, E. C.; Doyle, M. E., and Tisdall, F. F. Use of Ultra-violet Radiation in Reduction of Respiratory Cross Infections in a Children's Hospital Final Report. *J.A.M.A.*, 121:908-914, 1943.
32. Horsfall, F. L., Jr., and Bauer, J. H. Individual Isolation of Infected Animals in a Single Room. *J. Bact.*, 40:569-580, 1940.
33. Reyniers, J. A. Introduction to the Problem of Isolation and Elimination of Contamination in Experimental Biology. *Micrurgy and Germfree Methods*. Chas. C. Thomas, Co., Springfield, Ill., 1941.
34. Yaglou, C. P., and Wilson, U. Disinfection of Air by Air-Conditioning Processes. *Aerobiology*, Amer. Ass. Adv. Sci., 1942, pp. 129-132.
35. A.M.A. Council on Physical Therapy. Acceptance of Ultra-violet Lamps for Disinfecting Purposes. *J.A.M.A.*, 118:298-299, 1942; 122:503-504, 1943.
36. Wells, W. F. Bactericidal Irradiation of Air. I. Physical Factors. *J. Franklin Inst.*, 229:347-372, 1940.
37. Rentschler, H. C., Nagy, R., and Mouromseff, G. Bactericidal Effect of Ultra-violet Radiation. *J. Bact.*, 41:745-774, 1941.
38. Buttolph, L. J. Physical Basis of Air Disinfection by Ultra-violet Energy. *Arch. Phys. Ther.*, 25:671-682, 1944.
39. Hollaender, Alexander. Effects of Ultra-violet Radiation. *Ann. Rev. Phys.*, 8:1-16, 1946.
40. Lidwell, O. M. Bactericidal Effects of the Partial Irradiation of a Room with Ultra-violet Light. *J. Hyg.*, 44:333-341, 1946.
41. Buttolph, L. J., and Haynes, H. Basic Germicidal Fixture Design and Use. *Magazine of Light*, 1946, No. 1.
42. Wells, W. F. Ray Length in Sanitary Ventilation by Bactericidal Irradiation of Air; Circulation in Sanitary Ventilation by Bactericidal Irradiation of Air. *J. Franklin Inst.*, 238:185-193, 1944; 240:379-396, 1945.
43. Overholt, R. H., and Betts, R. H. Comparative Report on Infection of Thoracoplasty Wounds; Experiences with Ultra-violet Irradiation of Operating Room Air. *J. Thoracic Surg.*, 9:520-529, 1940.
44. del Mundo, F., and McKhann, C. F. Effect of Ultra-violet Irradiation of Air on Incidence of Infections in an Infants' Hospital. *Am. J. Dis. Child.*, 61:213-225, 1941.
45. Brooks, G. L., Wilson, U., and Blackfan, K. D. Studies of Cross-Infection in the Infants' Hospital in Boston. *Aerobiology*, Amer. Ass. Adv. Sci., 1942, pp. 228-232.
46. Wheeler, S. M., and Jones, T. D. Studies on the Aerial Transmission of Hemolytic Streptococci in a Rheumatic Fever Hospital. *Aerobiology*, Amer. Ass. Adv. Sci., 1942, pp. 237-241.
47. Sommer, H. E., and Stokes, J., Jr. Studies on Air-borne Infection in a Hospital Ward; The Effect of Ultra-violet Light on Cross-Infection in an Infants' Ward. *J. Pediat.*, 21:569-576, 1942.
48. Wells, W. F. Air Disinfection in Day Schools. *A.J.P.H.*, 33:1436-1443, 1943.
49. Wells, M. W. Ventilation in the Spread of Chickenpox and Measles Within School Rooms. *J.A.M.A.*, 129:197-200, 1945.
50. Wheeler, S. M., Ingraham, H. S., Hollaender, A., Lill, N. D., Gershon-Cohen, J., and Brown, E. W. Ultra-Violet Light Control of Air-Borne Infections in a Naval Training Center. Preliminary Report *A.J.P.H.*, 35:457-468, 1945.

51. Schneider, R., Hollaender, A., Caminita, B. H., Kolb, R. W., Fraser, H. F., duBuy, H. G., Neal, P. A., and Rosenblum, H. B. Effectiveness of Ultra-violet Irradiation of Upper Air for the Control of Bacterial Air Contamination in Sleeping Quarters. Preliminary Report. *Am. J. Hyg.*, 40:136-153, 1944.
52. Masterman, A. T. Air Purification by Hypochlorous Acid Gas. *J. Hyg.*, 41:44-64, 1941.
53. Lovelock, J. E., Lidwell, O. M., and Raymond, W. F. Aerial Disinfection. *Nature*, 153:20-21, 1944.
54. Stone, J. D., and Burnet, F. M. The Action of Halogens on Influenza Virus with Special Reference to the Action of Iodine Vapour on Virus Mists. *Australian J. Exper. Biol. & M. Sc.*, 23:205-212, 1945.
55. Robertson, O. H. Sterilization of Air with Glycol Vapors. *Harvey Lectures*, 38:227-254, 1942-43.
56. Puck, T. T., Robertson, O. H., and Lemon, H. M. The Bactericidal Action of Propylene Glycol Vapor on Microorganisms Suspended in Air. II. The Influence of Various Factors on the Activity of the Vapor. *J. Exper. Med.*, 78:387-406, 1943.
57. Robertson, O. H. Disinfection of Air by Germicidal Vapors and Mists. *A.J.P.H.*, 36:390-391, 1946.
58. Hamburger, M., Jr., Hurst, V., Robertson, O. H., and Puck, T. T. The Effect of Triethylene Glycol Vapor on Air-borne Beta Hemolytic Streptococci in Hospital Wards. III. The Action of Glycol Vapors at Low Relative Humidities. *J. Infect. Dis.*, 77:177-180, 1945.
59. Puck, T. T., Wise, H., and Robertson, O. H. A Device for Automatically Controlling the Concentration of Glycol Vapors in the Air. *J. Exper. Med.*, 80:377-381, 1944.
60. Hamburger, M., Jr., Puck, T. T., and Robertson, O. H. The Effect of Triethylene Glycol Vapor on Air-borne Beta Hemolytic Streptococci in Hospital Wards. I. *J. Infect. Dis.*, 76:208-215, 1945.
61. Puck, T. T., Hamburger, M., Jr., Robertson, O. H., and Hurst, V. Effect of Triethylene Glycol Vapor on Air-borne Beta Hemolytic Streptococci in Hospital Wards. II. Combined Action of Glycol Vapor and Dust Control Measures. *J. Infect. Dis.*, 76:216-225, 1945.
62. Navy Medical Research Unit No. 1. Laboratory and Field Studies of Glycols and Floor-Oiling in the Control of Air-borne Bacteria. *U. S. Nav. M. Bull.*, 42:1288-1308, 1944.
63. Mather, J. M., and McClure, A. D. Experiences with the Use of Propylene Glycol as a Bactericidal Aerosol in an R.C.A.F. Barracks. *Canad. Pub. Health J.*, 36:181-187, 1945.
64. Biggs, E., Jennings, B. H., and Olson, F. C. W. Epidemiologic Observations on the Use of Glycol Vapors for Air Sterilization. *A.J.P.H.*, 35:788-798, 1945.
65. Harris, T. N., and Stokes, J., Jr. Summary of a 3-Year Study of the Clinical Applications of the Disinfection of Air by Glycol Vapors. *Am. J. M. Sc.*, 209:152-156, 1945.
66. Puck, T. T., and Cheney, A. L. The Dispersal and Control of Triethylene Glycol Vapor for Aerial Disinfection. *Am. Indust. Hyg. Ass. Q.*, 7:10, 1946.
67. Thomas, J. C. Reduction of Dust-borne Bacteria by Oiling Floors. *Lancet*, ii:123-127, 1941.
68. Thomas, J. C., and van den Ende, M. The Reduction of Dust-borne Bacteria in the Air of Hospital Wards by Liquid Paraffin Treatment of Bedclothes. *Brit. M. J.*, i:953-958, 1941.
69. Harwood, F. C., Powney, J., and Edwards, C. W. A New Technique for the Application of Dust-Laying Oils to Hospital Bed-clothes. *Brit. M. J.*, i:615-616, 1944.
70. Bayley, C. H., and Weatherburn, A. S. Chemical Aspects of the Application of Dust-laying Oils to Wool. *Canad. J. Research*, 23:402-412, 1945.
71. Puck, T. T., Robertson, O. H., Wise, H., Loosli, C. G., and Lemon, H. M. The Oil Treatment of Bedclothes for the Control of Dust-borne Infection. I. Principles Underlying the Development and Use of a Satisfactory Oil-in-Water Emulsion. *Am. J. Hyg.*, 43:91-104, 1946.
72. Loosli, C. G., Wise, H., Lemon, H. M., Puck, T. T., and Robertson, O. H. The Oil Treatment of Bedclothes for the Control of Dust-borne Infection. II. The Use of Triton Oil Emulsion (T-13) as a Routine Laundry Procedure. *Am. J. Hyg.*, 43:105-119, 1946.
73. Rountree, P. M. Treatment of Hospital Blankets with Oil Emulsions and Bactericidal Action of "Fixanol C" (Cetyl Pyridium Bromide). *Australian M. J.*, 1:539-544, 1946.
74. Commission on Acute Respiratory Diseases and Commission on Air-borne Infections. Control of Respiratory Tract Infections in Army Barracks by Oiling Floors and Bedding. *Am. J. Hyg.*, 43:120-144, 1946.
75. Andrewes, C. H., and Glover, R. E. Spread of Infection from the Respiratory Tract of the Ferret. I. Transmission of Influenza A Virus. *Brit. J. Exper. Path.*, 22:91-97, 1941.
76. Loosli, C. G., Robertson, O. H., and Puck, T. T. The Production of Experimental Influenza in Mice by Inhalation of Atmospheres Containing Influenza Virus Dispersed as Fine Droplets. *J. Infect. Dis.*, 72:142-153, 1943.
77. Henle, W., Sommer, H. E., and Stokes, J., Jr. Studies on Air-borne Infection in a Hospital Ward. II. Effects of Ultra-violet Irradiation and Propylene Glycol Vaporization upon the Prevention of Experimental Air-borne Infection of Mice by Droplet Nuclei. *J. Pediat.*, 21:577-590, 1942.
78. Dunkin, G. W., and Laidlaw, P. P. Studies in Dog Distemper. I. Dog Distemper in the Ferret. II. Experimental Distemper in the Dog. III. Nature of the Virus. *J. Comp. Path. & Ther.*, 39:201-230, 1926.
79. Faber, H. K., Silverberg, R. J., and Dong, L. Poliomyelitis in the Cynomolgus Monkey. III. Infection by Inhalation of Droplet Nuclei and the Nasopharyngeal Portal of Entry, with a Note on this Mode of Infection in Rhesus. *J. Exper. Med.*, 80:39-57, 1944.
80. Rake, G. Air-borne Transmission of Measles. Personal Communication.
81. Commission on Acute Respiratory Diseases. The Present Status of the Etiology of Primary Atypical Pneumonia. *Bull. New York Acad. Med.*, 21:235-262, 1945.
82. McCoy, G. W. Accidental Psittacosis Infection among the Personnel of the Hygienic Laboratory. *Pub. Health Rep.*, 45:843-845, 1930.
83. Hornibrook, J. W., and Nelson, K. R. Institutional Outbreak of Pneumonitis. I. Epidemiological and Clinical Studies. *Pub. Health Rep.*, 55:1936-1944, 1940.
84. Commission on Acute Respiratory Diseases. A Laboratory Outbreak of Q Fever Caused by the Balkan Grippe Strain of Rickettsia Burnetti. *Am. J. Hyg.*, 44:123-157, 1946.
85. Commission on Acute Respiratory Diseases. Acute Respiratory Disease Among New Recruits. *A.J.P.H.*, 36:439-450, 1946.
86. Thompson, S., and Glazebrook, A. J. Infectious Disease in a Semi-closed Community. *J. Hyg.*, 41:570-615, 1941.
87. Bureau of Medicine and Surgery, Navy Dept., Washington, D. C. The Prevention of Respiratory Tract Bacterial Infections by Sulfadiazine Prophylaxis in the U. S. Navy, 1943-44. *Nav. Med.*, 284.

88. Feasby, W. R., and Bynoe, E. T. Survey of Hemolytic Streptococcus Infections at Camp Borden, Ontario, 1943. I. Epidemiology. *War Med.*, 5: 207-215, 1944.

89. Holbrook, W. P. The Army Air Forces Rheumatic Fever Control Program. *J.A.M.A.*, 126:84-87, 1944.

JAMES E. PERKINS, M.D., *Chairman*  
F. W. GILCREAS

ALEXANDER HOLLAENDER, Ph.D.

ALEXANDER D. LANGMUIR, M.D.,  
*Secretary*

O. H. ROBERTSON, M.D.

WILLIAM F. WELLS

GEORGE M. WHEATLEY, M.D.

C. P. YAGLOU

# Merit System Administration in Official Health Agencies

JOSEPH W. MOUNTIN, M.D., F.A.P.H.A., BESS A. CHENEY,  
AND DONALD F. SIMPSON

*Medical Director, and Personnel Methods Analysts, United States Public Health  
Service, Washington, D. C.*

SINCE 1940 a system of personnel administration on a merit basis has been required of state health departments participating in the Public Health Service grant-in-aid programs. There had never been enough qualified health workers, but severe as the personnel shortages were in 1940, they were tremendously intensified during the war years. Physicians, nurses, sanitary engineers, dentists, and laboratory technicians were first to leave public health agencies, many of them to enter the armed forces. Closely following were clerical, administrative and other non-professional employees, who, if not taken into the armed services, were drawn by war jobs and high wages to swollen defense industries. Circumstances were not favorable for the successful operation of a system of personnel administration which admittedly complicated the hiring of workers as compared to direct employment by the state health authority. Yet with heavy odds against success, the merit system with its many advantages to both employer and employee proved itself under the most trying conditions.

The objectives of the merit system have long been recognized as of great significance in public health activities. Public health, perhaps more than any other government service, is dependent on trained and efficient personnel.

Through the merit system, a health department can employ the best qualified and most efficient personnel available, and at the same time offer maximum employment security and opportunity.

In recognition of the trend in state and local governments toward a system of personnel administration based on merit principles, the Social Security Act, which provided for the expansion and improvement of health and welfare services, was amended in August, 1939, to require that state agencies receiving federal grants-in-aid operate under a merit system. A number of states had already adopted civil service laws by the time the merit system requirement was added to those parts of the Social Security Act which were administered by the Children's Bureau and the Social Security Board. The merit system requirement was not included in the part of the Act administered by the Public Health Service. Beginning in January, 1940, however, this requirement was included in the Surgeon General's regulations governing the administration of grants-in-aid.

The Public Health Service Act of 1944 which superseded Title VI of the Social Security Act, included grants for venereal disease control, tuberculosis control, and general health services. Regulations governing administration of grants under the new law required state

health department personnel administration on a merit basis as a condition for participation in these funds. The regulations provided that merit system rules should be submitted to the Public Health Service for review.

At first Public Health Service medical officers who had administrative experience were assigned to review and approve the rules. But both the amount and the technical nature of the work demonstrated the need for a staff trained in personnel methods. Consequently, a special unit was organized in the States Relations Division in July, 1941. The principal duties of the State Personnel Administration Unit, as the new organization came to be known, include reviewing state merit system rules and regulations and classification-compensation plans, advising Public Health Service district personnel on merit system policies and procedures, and consulting with state health departments on merit system administration.

Merit system plans are submitted to Public Health Service district offices for preliminary review. The district administrative analysts examine the organization and technical aspects of the plan. District medical, dental, nursing, and sanitary engineering consultants may also review the general organization of the merit system, but they direct their attention primarily to an analysis of class specifications in their respective fields and the compensation schedules for such classes.

A copy of the merit system plan is forwarded with district comments and recommendations to the State Personnel Administration Unit for review. A detailed analysis is prepared evaluating the plan in relation to the policies of the Public Health Service and accepted personnel standards. Amendments or revisions are suggested to the District Offices for whatever action is necessary to bring the plan into conformity with acceptable standards.

#### MERIT SYSTEM STANDARDS

The Public Health Service standards are applicable to all state employees rendering services in connection with programs for which the budgets utilize funds administered by the Public Health Service or state funds used for matching, and to persons having administrative responsibility for such programs unless specifically exempted. When the merit system is extended to local health departments, similar standards are applicable to local employees.

#### MERIT SYSTEM JURISDICTION

A considerable number of the initial rules governing the jurisdiction of the merit system did not meet standards. The exemption of confidential secretaries to state health officers, vital statistics workers, assistant or deputy state health officers, sanitarians, part-time clerks, non-professional laboratory workers, and unskilled laborers was chiefly responsible. One civil service law excluded from the classified service, "all superintendents, directors or other employees in the state government who of necessity must be licensed physicians, surgeons, or dentists."

Such exemptions could be removed by revising the rules in those states which operated under a joint or single agency merit system. The exemptions, while authorized under civil service laws, were not mandatory and health officers filled such positions from registers of eligibles. The solution to this problem set the pattern for meeting many of the conformity issues which arose over statutory provisions.

#### MERIT SYSTEM ORGANIZATION

Civil service commissions, the oldest form of merit system organization, have been established in 21 jurisdictions. Civil service organization varies from state to state but for the most part all are modeled after the United States Civil Service Commission. The standard

civil service law provides for three commissioners of whom not more than two may be members of the same political party. They are appointed by the state governor to serve for overlapping terms. In most cases the commissioners are reimbursed for incidental costs in connection with official meetings but receive no other compensation. The commission sets the policies, writes the regulations, and supervises the general administration of the merit system program. Specifically, it is responsible for the preparation of classification and compensation plans, a competitive examination system, appeal procedures, and rules and regulations governing the conditions of employment and all personnel actions. To aid in the discharge of these responsibilities, the commission selects a secretary, chief examiner, or personnel director to head a staff of personnel experts and clerical aides.

Joint merit system agencies have been established in 26 jurisdictions. In contrast to the civil service commissions, most of the joint agencies had no statutory support in the beginning, although there has been a trend toward such endorsement during the last two or three years. The joint agencies have usually been established by written agreement of the state agencies participating in grant-in-aid programs. The regulations are generally modeled after the *Draft Rule for a Merit System of Personnel Administration*, published by the Social Security Board in November, 1939.

Merit system councils usually have three members appointed by the participating agencies or by the governor on the recommendation of the agencies. They serve for overlapping terms of office and are paid only expenses incurred in attending official meetings. The qualifications of council members are more strictly defined than are those of civil service commissioners. The members must be "public spirited persons of recognized standing and of

known interest in the improvement of public administration and in the impartial selection of efficient government personnel," according to the Draft Rule. They may not have held political office, nor have been officers in political organizations, nor have been employed by a participating agency during the year preceding appointment.

Civil service commissions are empowered by law to establish and administer merit systems. Most functions of the merit system councils, in contrast, are advisory. The rules and regulations are written and classification and compensation plans prepared by the agencies with technical advice from the councils. Like the civil service commissions, merit system councils hear appeals, or appoint impartial boards to hold hearings for them, select merit system supervisors, and promote public understanding of the merit system.

Four state health departments still operate their own merit systems. The Public Health Service gives only temporary approval to such single agency systems, pending organization of joint agencies or civil service commissions. Written justification is required from the state health officer establishing the necessity for a single agency. Four other state health departments originally established single agency merit systems. Three were superseded by joint agencies and one was placed under the jurisdiction of the state civil service commission.

The merit system supervisor is chiefly responsible for the administration of merit system procedures. The rules usually provide that he shall have training and experience in personnel management and be of known sympathy toward the merit principle in public service. Most merit system supervisors are selected from registers of eligibles established from the results of open competitive examinations. The major functions of the supervisors are: (1) to prepare, administer, and score examinations; (2)

to establish and maintain registers of eligibles; (3) to determine the availability of eligibles for appointment; (4) to certify eligibles for appointment; (5) to determine the adequacy of existing registers and schedule examinations in accordance therewith; and (6) to develop and administer such other procedures as the council or merit system rules may require.

The merit system rules did not conform to the standards used by the Public Health Service in reviewing methods of personnel administration in four civil service, seven joint agency, and four single agency jurisdictions. Under some civil service laws administrative responsibility is divided among the commissioners instead of being delegated to a personnel director. This lack of integration may have contributed to the difficulties of personnel administration experienced under war conditions. In these civil service states there are more health department employees without permanent status than in most merit system jurisdictions. Some civil service commissions have held no formal examinations for four or five years.

Personnel procedures must be flexible enough to meet changing economic, political, and social conditions. Civil service laws which include detailed procedures tend to become obsolete. It is therefore preferable to establish the merit principle in law and the procedures for its application in administrative rules and regulations; otherwise the rigidity imposed may be too restrictive for efficient and impartial administration.

Both joint and single agency merit systems are more flexible because administrative rules are comparatively easy to revise. They have been criticised principally on the high cost of administration per employee, restricted employment opportunities, and wage differentials in comparison with non-participating state agencies.

#### CLASSIFICATION PLANS

The classification plan including specifications for all classes of positions in the approved health department plan serves two purposes. It is designed "to lay the foundation for equitable treatment for public employees by the accurate definition, orderly arrangement, and fair evaluation of positions in the public service,"<sup>1</sup> and to provide appointing authorities with a systematic method of employing and evaluating personnel. Specifications for classes of positions are as necessary and important to an appointing authority as specifications for building materials are to a contractor. Unless the employing agent knows the exact nature of a job, with the qualifications necessary for competent performance, he will not be able to select the best available worker.

Health department classification plans are submitted to the Public Health Service for review. The titles, definitions, examples of work, and minimum qualifications of specifications included in the plans frequently need revision to bring them into conformity with acceptable standards. The specifications usually describe the technical operations satisfactorily but often do not include the degree of supervision under which the work will be performed, the responsibility for the work of others, and properly defined minimum qualifications.

Professional titles should be applied only to professional classes. For example, the title "bacteriologist" has been used for a laboratory position which did not require professional training. The Public Health Service recommends the use of a title such as "laboratory technician." Occasionally titles were applied which were unrelated to the duties described. In one state the truck driver and photographic equipment operator for the Bureau of Health Education was called "Assistant—Bureau of Health Education."

Class definitions should be short, gen-

eral statements of the principal duties and responsibilities of the class which distinguish it from other classes. They should be clear enough so that an accurate organization chart could be drawn without additional information. This technique is used by the State Personnel Administration Unit analysts in reviewing classification plans.

Concise statements which illustrate the duties and responsibilities typical of the class should be included in the examples of work. It is occasionally apparent from the class definition that certain important and typical examples have been omitted. The specification for an assistant director of a major division, for example, should include the duty of acting for the division director in his absence. The examples of work should indicate those performed under supervision and those on the initiative of the employee. Essentially incidental duties should not be included. Specifications should not be "written up" to make a job appear more difficult or more responsible than it actually is.

Minimum qualifications necessary for satisfactory job performance should specify the amount, recency, and kinds of both education and experience which the applicant must have. They should be appropriate to the duties, responsibilities, and examples of work in the specifications, for only then will the specifications provide an adequate basis for evaluating applications or for preparing examinations.

The amount of formal education required sometimes is unrelated to the duties and responsibilities of the class. Specifications for vital statistics, laboratory, and health education directors which required M.D. degrees have been submitted in which the duties and responsibilities failed to establish any necessity for a medical education. The substitution of experience for training sometimes serves to nullify educational standards. Specifications have been

submitted for certain positions which required college graduation and yet permitted year for year substitution of experience for training up to a maximum of eight years.

#### COMPENSATION PLANS

A compensation plan must include all positions in the classification plan. Salary schedules for each class are reviewed in terms of: (1) the application of the principle of equal pay for equal work, (2) the adjustment of the salary range to the responsibility and difficulty of the work involved, (3) a realistic recognition of prevailing wage levels for similar positions in private industry and other public agencies in the locality, and (4) the economic law of supply and demand in relation to current labor markets. Each salary schedule should include maximum, minimum, and, unless prohibited by law, intervening rates of pay.

Almost all the rules establishing compensation plans were well written except those dealing with special wartime provisions. In March, 1943, most of the states relaxed standards to allow original appointments at a pay level higher than the minimum rate. The Public Health Service agreed to this procedure but required safeguards which provided: (1) appointments should be made above the minimum only for the duration of the war emergency; (2) such appointments should be made only at one of the regularly established intervening pay steps; (3) all eligibles higher on a register should be offered the job at the higher entrance rate; (4) no employees in the class should be below the higher rate when an appointment above the minimum is made, and (5) all appointments above the minimum should be approved by the merit system council or civil service commission following written request for such approval by the appointing authority.

The use of formal compensation plans



as instruments of personnel management was unfamiliar to many of the state health agencies which had no previous experience with a merit system of personnel administration. An analysis of the salary schedules for a typical health department showed that there were 85 classes with 48 different salary ranges: 32 applying to but one class, 7 applying to two, and 9 applying to more than two. In contrast there are fewer than fifty different salary ranges for the thousands of federal civil service classes. Comparatively few salary ranges are needed when compensation is determined on the basis of duties and responsibilities and in accordance with the principle of equal pay for equal work.

According to generally accepted standards, the salary range from minimum to maximum should be between 20 and 25 per cent of the minimum pay rate. In the compensation plan studied 29 ranges were more than 25 per cent, 13 less than 20 per cent, and only 6 fell within the generally accepted range.

A number of the salary scales with identical minimum pay rates extended to different maximum rates. For example, there were five salary scales starting at \$175 which extended to maximum rates of \$200, \$215, \$230, \$235, and \$250. When duties and responsibilities of classes are similar enough to justify identical entrance salaries, the only reason for varying maximum rates is to provide for long and efficient service in those classes which offer no promotional opportunities.

#### RECRUITMENT

The recruitment of qualified workers is an important function of the personnel agency. Most merit system organizations in the past have taken advantage of a favorable employers' market instead of conducting positive and aggressive recruiting. By January, 1942, the shortage of qualified personnel had reached a critical stage. Health

departments sought to overcome the shortages by lowering employment standards. As an alternative certain changes in methods of recruitment and employment were suggested. Health departments were urged (1) to eliminate state and local residence requirements and discrimination on the basis of sex or marital status, (2) to increase salaries, (3) to provide for continuous receipt of applications and administration of examinations whenever enough applicants to assure adequate competition were available, (4) to administer joint examinations for two or more jurisdictions with common classes of positions, (5) to remove the 6 months' limitation on provisional appointments, and (6) to provide certification of more than the required number of names for each vacancy from those registers where availability of applicants changed rapidly.

At the same time it was suggested that if these recommendations did not solve recruiting problems, the states might establish war emergency classes involving a lesser degree of responsibility, closer supervision, and qualifications modified as to education and experience. Positions in war emergency classes should be filled from registers established according to the results of relatively simple examinations of general intelligence and aptitude for a particular job. Titles such as Acting Health Officer, Public Health Nursing Aide, or Engineering Assistant were suggested to distinguish them from regularly constituted classes meeting appropriate standards on minimum qualifications.

#### EXAMINATIONS

The process of selection by means of competitive tests is indispensable to a merit system of personnel administration. Objective written examinations are by far the most valid, practical, and inexpensive that can be used in the selection of qualified personnel. The

more usual practice among the states has been to give examinations consisting of subjective, essay-type written tests, a rating of training and experience, and an oral interview. Such examinations have been criticised because they fail actually to measure knowledge and ability, do not assure competition, and do not provide absolute impartiality in selection.

The American Public Health Association through its Merit System Unit has been engaged in a program to develop valid and reliable examinations for professional and technical health department positions since May, 1940. Recognizing the acute need for such examinations, both the Public Health Service and the Children's Bureau have given financial support to the program from its inception.

The Merit System Unit prepares examinations in eight major public health fields and nine specialties within those fields. The general categories include public health nursing, public health administration (health officers), public health laboratories, environmental sanitation, sanitary engineering, medical social work, vital statistics, and health education. The specialties within the general categories cover orthopedic nursing, nurse midwifery, industrial nursing, physiotherapy, x-ray technology, pathology, food and drug chemistry, entomology, and nutrition.

The examinations are prepared to fit the needs of the state and local health departments using them. Class specifications setting forth the duties and responsibilities as well as the minimum qualifications pertaining to a group of positions are submitted by the health departments requesting the preparation of examinations. These examinations are outlined according to the subject matter areas which must be covered to measure the knowledge and ability necessary for satisfactory job performance. An examination for the position of labo-

ratory director, for example, may cover such areas as food and drug chemistry, bacteriology, public health laws and regulations, laboratory administration, etc., depending on the kinds of knowledge required in the specifications.

The questions are prepared by persons professionally or technically trained in public health and actually employed in health department positions. They are trained and supervised by subject matter consultants, who are highly qualified by both training and experience, and who have been selected for each field of public health in which examinations are prepared. The consultants also work in close liaison with the psychometrician of the Merit System Unit in editing, classifying, and determining the relative difficulty of every question. The questions are subsequently submitted to a board of expert reviewers for final check. The reviewers rule on the effectiveness of each question as a measuring device and on the level of difficulty assigned each item. On the basis of the comments and recommendations made by the reviewers, the questions are revised and a final draft is prepared by the consultant and the psychometrician. Consultants construct the basic outline of each examination and prepare the preliminary draft. The psychometrician is primarily responsible for the validity and reliability of the examinations. Since evaluation of test results is a necessary part of test construction, the agencies to which tests are supplied are urged to return original or duplicate answer sheets after the tests have been scored and candidates graded.

The American Public Health Association examinations have been very favorably received in all jurisdictions in which they have been used. Many of the states which originally ordered only public health nursing examinations have later asked for tests in the fields of sani-

tary engineering, public health laboratories, environmental sanitation, etc. The work has progressed so far that as of September 1, 1946, 195 A.P.H.A. examinations have been prepared for twenty-five state and three city health departments.

The Merit System Unit has recently expanded its program to include field consultation service. This service will be available to any state or local personnel agency or health department which requests it. The field consultant will be in a position to advise with such agencies, not only on problems directly related to examinations, but also on the other phases of public health personnel procedures.

#### ELIGIBLE LISTS

After examinations are graded a register of candidates eligible for appointment, arranged according to grade, is established for each class. The procedures followed in establishing and using registers were generally acceptable. Sometimes the method of removing the names of eligibles was too arbitrary. Names should be removed only when eligibles cannot be located, when any state job has been declined, or when three appointments have been refused.

In order to provide for reemployment of persons who resign or who are separated without prejudice, reemployment registers should be established or the rules should contain a formula for inserting the names of permanent employees on the original registers in approximately the same order as originally placed. A few of the states did not include such a formula nor satisfactory procedures for the removal of names from registers.

#### CERTIFICATION

Upon requisition from an appointing authority, the merit system supervisor certifies the highest ranking available

persons on the register. Appointing authorities sometimes were allowed to requisition personnel according to special requirements not listed in the specifications. Unless selective certification is properly safeguarded it may favor applicants of lesser ability at the expense of the better qualified personnel higher on the register. Selective certification is a practical means for filling a position which requires both generalized knowledge and specialized qualifications included usually as an option in the class specification. For example, a health department may need a county public health nurse who can devote two-thirds of her time to general public health nursing and the remaining third to industrial nursing. By including in the requisition special and additional qualifications in the field of industrial nursing, it is neither necessary to establish a separate class for this position nor to hold a special examination for it.

The rules should specify the number to be certified for each vacancy in a class. To provide no restriction on the choice of an appointing authority would completely destroy the merit principle in the selection of personnel. The common practice has been to certify three names. During the war years many states permitted certification of the whole register of available eligibles in the interests of speeding up appointments.

#### APPOINTMENTS

Although state rules governing permanent appointment were generally satisfactory, those for probationary, provisional, temporary, emergency, and war emergency appointments were in some cases not in conformity with acceptable standards. Probationary periods of established duration were not always provided for in the rules. A statement that the probationary period had been satisfactorily completed was not always required prior to per-

manent appointment. Since the probation period is an essential part of the examination process, no employee should gain permanent status through default. Provisions for salary advancements, promotions, or transfers during the probation period were sometimes not in accordance with accepted standards.

Provisional, temporary, emergency, and war emergency appointments often were not clearly defined in the rules. Provisional appointments should be limited to a period of 6 months, or at most until registers of eligibles are established, whichever is sooner. (The Public Health Service waived this requirement for the duration of the war.) Emergency appointments should be made only when there is an immediate and urgent need for persons who cannot be obtained from appropriate registers. Further, they should be limited to a period no longer than 30 days and repeated appointments should not be made since emergency employees can be replaced with regular appointees if the emergency lasts more than 30 days. Temporary appointments should be made for short term jobs from registers of eligibles willing to accept them. War emergency appointments are no longer necessary.

#### SUPPLEMENTARY RULES AND REGULATIONS

In order to protect the merit principle, public employees are prohibited in most merit system rules from taking an active role in party management, election campaigns, and soliciting or contributing campaign funds. However, each employee retains the right to vote as he pleases and to express privately his opinions on all public issues.

A system of personnel administration should include regulations governing vacation, sick, military, educational, and other types of leave; periodic service ratings; and maintenance of adequate personnel records. Such regulations may

not be included in the merit system rule. In many jurisdictions these activities are regulated by standard practices which are not in written form.

The rules on payroll certification generally conformed to accepted standards. However, several states provided for payroll audits as infrequently as once every 3 or 6 months, or as ambiguously as "from time to time." The merit system supervisor should certify that each person on the pay roll is legally employed and that the amounts paid are in accordance with the compensation plan. Pre-audits of all health department pay rolls at every pay period are preferred but post-audits are accepted if made within 2 weeks following payment.

The right of appeal from administrative decisions concerning examinations, classifications, and disciplinary actions is recognized in all the civil service or merit system rules. The rules provide that the civil service commission or merit system council shall hear such appeals or shall appoint an impartial board to hold hearings on its behalf. A definite time limit for filing appeals should be established to avoid so delaying proceedings as to work a hardship on the plaintiff and to result in loss of evidence or testimony. The conditions under which appeals can be brought should also be defined or limited, in order that the merit system council or civil service commission may not be overburdened.

Many state health departments need to develop regulations governing such internal procedures as appointments, transfers, separations, salary advancements and promotions, attendance and leave, individual employee records, and systems of periodic service ratings. In addition most of them must soon terminate such wartime procedures as the use of war emergency classes and war duration appointments. This will involve either the preparation of new

class specifications or the revision of existing specifications. Readjustments in salary schedules will have to be made and examination techniques revised. Perhaps the most difficult problems will be the replacement of war service appointees and the application of new laws and regulations concerning veteran preference.

## CONCLUSION

During the war personnel shortages were so severe that regular merit system employment procedures were frequently suspended. Competitive examinations for health department positions could not be held because of an insufficient number of candidates. Nevertheless, records of 43 health departments, em-

## EMPLOYMENT STATUS OF HEALTH DEPARTMENT PERSONNEL

JULY 1, 1945

State	Merit System Status				Provisional and Emergency				Unclassified and Exempt				Total
	Prof. Tech.	Sten. Cler.	Admin. Other	Total	Prof. Tech.	Sten. Cler.	Admin. Other	Total	Prof. Tech.	Sten. Cler.	Admin. Other	Total	
Alabama	40	107	28	175	36	7	2	45	..	..	2	2	222
Alaska	6	3	..	9	25	12	..	37	..	..	..	..	46
Arizona	57	34	15	106	11	10	..	21	10	..	3	13	140
Arkansas	..	107	1	108	134	60	43	237	1	..	..	1	346
California	132	156	131	419	99	127	43	269	..	..	1	1	689
Colorado	6	60	2	68	36	3	6	45	..	..	..	..	113
Connecticut	110	113	55	278	..	9	..	9	..	..	..	..	287
Delaware	29	10	9	48	11	6	1	18	8	7	5	20	86
Florida	38	76	110	224	357	194	25	576	28	12	13	53	853
Georgia	78	110	7	195	34	28	6	68	1	..	28	29	292
Hawaii	181	81	70	332	31	9	2	42	2	..	..	2	376
Idaho	62	30	8	100	11	2	4	17	..	..	..	..	117
Indiana	144	70	3	217	5	9	..	14	..	..	..	..	231
Illinois	163	207	4	374	181	187	..	368	..	..	1	1	743
Iowa	..	55	2	57	..	..	2	2	125	6	10	141	200
Kansas	141	73	15	229	31	20	6	57	39	..	1	40	326
Kentucky	283	337	242	862	7	17	37	61	55	..	..	55	978
Louisiana	228	210	60	498	93	85	174	352	198	1	8	207	1,057
Maine	84	74	15	173	..	..	..	..	..	..	1	1	174
Maryland	195	109	10	314	22	32	2	56	..	..	..	..	370
Massachusetts	161	126	43	330	74	98	9	181	..	..	..	..	511
Michigan	115	108	65	288	82	66	75	223	1	..	..	1	512
Minnesota	80	109	35	224	27	50	19	96	1	..	2	3	323
Mississippi	..	..	..	..	..	..	..	..	..	..	..	..	..
Missouri	..	..	..	..	..	..	..	..	..	..	..	..	..
Montana	..	18	..	18	47	5	2	54	..	..	..	..	72
Nebraska	57	54	8	119	12	9	..	21	15	..	..	15	155
Nevada	16	8	4	28	2	..	..	2	..	1	2	3	33
New Hampshire	33	32	12	77	5	1	..	6	..	..	1	1	84
New Jersey	198	107	22	327	41	43	5	89	4	1	6	11	427
New Mexico	48	66	14	128	19	18	4	41	24	..	19	43	212
New York	275	367	25	667	60	87	1	148	43	..	..	43	858
N. Carolina	7	242	..	249	601	58	98	757	15	..	6	21	1,027
N. Dakota	..	..	..	..	..	..	..	..	..	..	..	..	..
Ohio	19	67	5	91	268	99	15	382	2	..	1	3	476
Oklahoma	..	..	..	..	..	..	..	..	..	..	..	..	..
Oregon	24	22	3	49	11	9	4	24	3	..	..	3	76
Pennsylvania	200	146	103	449	99	100	82	281	73	229	..	302	1,032
Puerto Rico	788	443	553	1,784	735	421	1,737	2,893	3	1	87	91	4,768
Rhode Island	..	..	..	..	..	..	..	..	..	..	..	..	..
South Carolina	..	..	..	..	..	..	..	..	..	..	..	..	..
South Dakota	35	26	2	63	6	3	2	11	1	..	..	1	75
Tennessee	..	..	..	..	..	..	..	..	..	..	..	..	..
Texas	107	85	17	209	625	347	29	1,001	81	..	441	522	1,732
Utah	..	..	..	..	..	..	..	..	..	..	..	..	..
Vermont	28	19	1	48	26	3	..	29	2	..	..	2	79
Virginia	208	156	7	371	86	30	1	117	..	..	..	..	488
Washington	42	66	10	118	12	28	3	43	4	..	2	6	167
West Virginia	152	89	7	248	66	15	1	82	13	4	2	19	349
Wisconsin	107	135	55	297	..	..	1	1	..	..	8	8	306
Wyoming	10	13	1	24	14	4	1	19	..	..	..	..	43
Total	4,687	4,526	1,779	10,992	4,042	2,311	2,442	8,795	753	262	649	1,664	21,451

ploying 21,451 workers, show that about half, or 10,992, have merit status; 8,795 hold provisional, emergency, or war emergency appointments established by merit system rules, and only 1,664 were in exempt classes. These figures are derived from reports on the status of personnel in state and territorial health departments on July 1, 1945. Detailed figures are shown in the accompanying table.

The number of health department employees with merit status is evidence that, in spite of wartime difficulties, great progress has been made in placing personnel administration on a merit basis. During the war the Public Health Service was unable to provide state

health agencies with the services they requested. The State Personnel Administration Unit could seldom assist, for example, in preparing class specifications, developing compensation plans, establishing personnel record systems, rating scales, and other instruments of personnel management. The Public Health Service now plans not only to provide the assistance requested by health departments, but also, through periodic reviews of personnel activities, to determine how best to serve in strengthening their merit systems.

#### REFERENCE

1. White, Leonard D. *Introduction to the Study of Public Administration*. Macmillan, 1942, p. 279.

# Proposed Report on the Educational Qualifications of Public Health Engineers<sup>\*†</sup>

THE term "public health engineer" as used in this report refers to the sanitary engineer, employed by a public health agency, who is trained in methods for the control and proper use of factors of the environment to the end that the public health is improved or protected.

The term "public health engineering" as used in this report includes the public health aspects of all types of environmental conditions whose control is based upon engineering principles. All procedures of public health agencies that depend upon engineering materials or methods for environmental conditions should be considered as public health engineering activities.

## I. GENERAL SCOPE OF ENGINEERS IN PUBLIC HEALTH PROGRAMS

Sanitary engineers with basic training in civil engineering early developed competence in water supply, sewage, and waste disposal. In order adequately to meet the problems of design and operation of such sanitary work, a knowledge of the chemistry and biology of these services became essential. This

enlarged their sphere of interest, and in the course of time caused them to take an active part in all those problems concerned with the promotion and preservation of the public health to which engineers are able to contribute a significant solution.

The practice of public health engineering includes not only the activities of engineers in official health agencies in their investigations, review of plans, and supervision of the operation of sanitary works, but also the functions of engineers in private practice or in government organizations other than health agencies in the design, operation, and control of sanitary works. In order to be qualified to review plans and supervise operations, therefore, the public health engineer must be trained and qualified not only to advise on problems of sanitation, but also to design and construct sanitary works.

Public health activities may be divided into two distinct but closely interrelated fields, one having to do with the human element and the other with the environment. The first is normally the field of the physician and the nurse, while the second is that of the engineer and other sanitation personnel. There is no distinct separation between these activities, but there is a middle ground in which the activities of the physician and engineer merge. Therefore, successful operation of a public health program demands administrative participation and careful planning by both physician and engineer.

A complete public health program must include adequate provision for

<sup>\*</sup> This report was presented by the Committee on Professional Education to the Governing Council on November 13, 1946, and was approved in principle by the Governing Council with the recommendation that the report be published in the *January Journal* and, if no serious criticisms are received from members and Fellows of the Association, the report becomes final and, adopted as an official report of the Association as of March 1, 1947.

This report, like all other statements of the committee on professional and technical qualifications in public health, is subject to periodic revision in order that it may be kept abreast of the best thought.

<sup>†</sup> This proposed report is a revision of the report on the Educational Qualifications of Public Health Engineers approved by the Governing Council on October 5, 1937.

both the human element and the environment. The health officer aided by an adequate and competent engineering staff can assure the needed administrative assistance and technical advice necessary to provide a complete program. Not only is the public health engineer responsible for the engineering aspects of strictly public health phases of community life but he must also participate and assist in planning, designing, building, and operating of other engineering facilities, which are the primary responsibility of other branches of government, in order to promote and protect public health.

It is evident then that the department of health, through its engineering division or bureau, does not operate as an isolated unit, but that it contributes to the maintenance of an orderly and properly functioning society in coöperation with many other departments of government having engineering functions. A broad concept of the social, political, and economic forces that operate in the community is essential to the recognition and development of such a program.

There is a considerable expansion of health programs taking place both at state and local levels as well as in industry. The number of engineers in public health work must be increased enormously if the needs are to be met. Expansion of related programs of public works construction, slum clearance, and urban redevelopment, industrial activity and stream pollution control will require additional numbers of similarly trained men. Conservative estimates place the number of public health engineers needed, in addition to those on the job now, at more than 1,000 to meet only the minimum needs for local health services. It is recommended that a population unit of 50,000 or more requires the services of at least one public health engineer plus an adequate number of assistants. Only by the

establishment of high professional standards, with a corresponding increase in salaries, can the required number of competent persons be obtained and their services retained.

## II. THE ACTIVITIES AND FUNCTIONS OF ENGINEERS IN PUBLIC HEALTH

One of the major activities of public health engineers is that of supervising the development and operation of sanitary works in order to control properly those aspects that may affect the public health. The engineering procedures involved and the place of the public health engineer in the supervision, development and operation of such works are:

- a. Investigating and planning
- b. Designing and preparing specifications
- c. Construction
- d. Maintenance and operation

Except as discussed later, the design and construction of sanitary works is commonly assigned to engineers in private or consulting practice, public engineering organizations developed for this specific purpose, such as the New York Board of Water Supply or the Chicago Sanitary District, and the personnel of existing governmental agencies, such as the Department of Public Works. The maintenance and operation of the structures is then generally taken over by existing or specially organized departments or appropriate political subdivisions.

The proper development and operation of sanitary works are matters of public concern in general and of public health in particular. Since profit or other economic motives are often associated with the development and operation of sanitary works, and since there may be a conflict of interest between different regions, communities, or industries and their sanitary needs, supervision and regulation is placed in governmental agencies including the



engineering subdivision of health departments. Briefly, those organizations are entrusted with the following activities:

- e. Investigation of sanitary needs, and stimulation to provide necessary remedial measures
- f. Advice relative to and approval of proposed works and approval of completed works
- g. Supervision of operation and maintenance of existing works
- h. Development and enforcement of rules and regulations

Procedures (e) to (h) are complementary to the fundamental engineering procedures involved in the development and operation of sanitary works procedures (a) to (d) and have been interpolated for the purpose of establishing a reasonable system of checks and balances in the interest of health and welfare. Competently to fulfil procedures (e) to (h) the responsible engineer must possess the fundamental qualifications required by procedures (a) to (d) as well as additional qualifications related to the public health and welfare aspects of these activities. In the federal government and in some states and their subdivisions, the design, construction, and operation of sanitary works connected with governmental institutions and the design, construction, and operation of mosquito-control and rodent-control projects are assigned to the engineering organizations of their respective health agencies.

Public health engineering includes not only supervision of the development and operation of sanitary works as outlined above, but also participation in the planning, design, construction, operation, and maintenance of other physical elements that contribute to the support of community life so that the protection and promotion of public health can be assured. Some of these other physical elements are: dwellings; structures, and equipment used to produce, process, and distribute the food supply; environmental conditions which support disease-bearing insects and rodent life, and the

growth of noxious weeds; industrial structures and equipment with especial reference to the effect on the air breathed in such industries as well as the other physical hazards therein.

The following are listed as public health engineering activities, as now carried on:

1. Water supply and treatment; design and installation of sewers, sewage and industrial waste disposal; stream pollution control; bathing place control; and mosquito control measures.
2. Municipal and rural waste disposal and insect, rodent, vermin and weed control.
3. Food sanitation, including the production and pasteurization of milk and the manufacture of ice cream and other dairy products; the sanitary production of shellfish, and the production, storage, and distribution of meat, poultry, pastry, bakery goods, fish, and other foods as well as the sanitation of eating and drinking establishments.
4. The sanitation of schools, camps, public places, swimming pools, and recreational areas.
5. Programs to promote healthful housing for all people.
6. Industrial hygiene and sanitation. This involves those special engineering problems incident to industrial processes and includes the many features of environmental sanitation. Industrial sanitation should, therefore, be under the direction of a public health engineer.
7. In cities particularly, proper city planning, heating, lighting, and ventilation of buildings, plumbing, aerial pollution, and noise. These problems are largely engineering in character. Any program to influence them for the benefit of public health must be based on engineering investigations and solutions.

### III. THE EDUCATIONAL BACKGROUND OF PUBLIC HEALTH ENGINEERS

Public health engineers must possess two distinct and essential educational qualifications: (a) basic education and training in engineering, and (b) specialized knowledge and ability in sanitary science, sanitary engineering, and public health.

#### a. *Basic Engineering Education*

The public health engineer should be a graduate of a full four year or longer course

leading to a bachelor's or higher degree\* at a college or university of recognized standing† with the major study and the basis of the degree in a course such as sanitary or public health engineering, or the sanitary option in civil engineering. In the case of public health engineers entering industrial sanitation, mechanical or chemical engineering is preferred.

In so far as the academic requirements are concerned, the basic education of the engineer should make him eligible for admission to examination for licensure to practise professional engineering in the state of his employment.

#### *b. Specialized Education and Training*

The varied functions of a public health engineer necessitate additional education beyond that ordinarily acquired by basic training in engineering. Successful performance in his field requires: (a) an intimate and working knowledge of the physical, chemical, biological, and engineering sciences upon which the sanitary control of the environment is based, and (b) the ability to identify, evaluate, and explain in terms of their public health implications those environmental factors that will promote and protect health or those that are capable of injuring health.

This specialized knowledge lies mainly in three fields: (1) sanitary science, (2) sanitary engineering, and (3) public health. The elements of these are indicated in the outline of graduate education, Section IV. In the rigorous undergraduate engineering curriculum the amount of time that can be allotted to specialized study in these three fields without impairing the basic engineering education is quite limited—generally not more than about 15 per cent of the total scheduled instruction. Adequate preparation of an engineer for a career in public health requires one or more years of specialized study as outlined in Sec-

tion IV and a period of supervised experience in addition to the minimum of four years required for graduation in engineering. However, to enable the graduate in engineering to begin work and gain experience and to prepare him for graduate study it is desirable that his undergraduate program should include as much instruction as possible in the fundamental sanitary sciences—especially bacteriology and chemistry—and in the principles of sanitary engineering and public health.

The program of study, preparing for a career in public health engineering, falls into three categories:

1. Sanitary Options in Four-year Undergraduate Curricula of Civil Engineering—In 1944 twenty-three such curricula remained accredited by the Engineers' Council for Professional Development.\* The accredited options, for which information is available, allotted from 8 to 20 per cent of the period of study to the subjects of primary importance to sanitary engineers; namely, chemistry (beyond freshman chemistry), biology (including bacteriology), hydrology or hydraulic engineering, sanitary engineering, and public health. There are no sanitary options in chemical and mechanical engineering, those most closely allied to industrial hygiene.

2. Four year Undergraduate Curricula in Sanitary Engineering—In 1944 three such curricula remained accredited by the Engineers' Council for Professional Development. One of these three accredited curricula had been discontinued by its institution. Registration for programs of this type has long been very low and the outlook for a continuation of these programs is uncertain. The accredited curricula allotted from 13 to 25 per cent of the period of study to the subjects of primary importance to sanitary engineers (see "1" above). None of these curricula is oriented particularly toward the practice of industrial hygiene.

3. Graduate Curricula in Sanitary Engineering and Public Health—These include two general types of programs, those in which the major study and graduate degree are in sanitary engineering and those in which the major study and degree are in public health. Such programs provide opportunities for engineers with little or no training in public health engineering to develop a sufficient background to

\* In making this recommendation the American Public Health Association expressly recognizes that there are many persons now actively engaged in public health work who are lacking in formal education but whose training or experience should be accepted as fully equivalent to the basic engineering education defined above. The basis of substitution shall be at least two years of appropriate training or experience equivalent to one year of formal engineering education. Such persons who have sufficient equivalent training or experience to substitute for the accredited engineering education they lack shall be considered professional engineers for the purpose of this report.

† A college or university of recognized standing is defined as one which is accredited by a national or regional accrediting association such as the Association of American Universities, or the New England, Middle State, North Central, Southern, or Northwest Association of Secondary or Higher Schools, or one whose engineering curricula have been accredited by the Engineers' Council for Professional Development.

\* At the present time the Engineers' Council for Professional Development is the only accrediting agency of national scope which examines and accredits curricula in sanitary engineering and sanitary option of civil engineering.

begin work in public health. They also provide advanced graduate instruction for those who have completed undergraduate programs in sanitary options or sanitary engineering. Either of the two types of programs should be accepted as satisfactory for these purposes if they include adequate instruction in each of the three essential fields of knowledge previously outlined and enough choice of electives to meet the needs of students with varying backgrounds of previous training and experience. As yet there are no accrediting agencies that examine and accredit graduate curricula in sanitary or public health engineering.

As a minimum for initial employment as a public health engineer the graduate engineer should have completed an approved undergraduate sanitary option or sanitary engineering program; or, in addition to graduation in engineering, should have received an equivalent amount and similar character of approved postgraduate education or in-service training. Such postgraduate training can best be obtained through study in an approved educational institution but may be provided by postgraduate self-education or in-service training during a period of probationary employment under competent public health engineering supervision. A young engineer, at first occupied in a subordinate position, should work under close public health engineering supervision until he has prepared himself by experience or graduate study for positions of major responsibility. Graduate education affords the greatest assurance that the public health engineer will become both broadly competent and well grounded in the subjects that are fundamental to sanitary progress.

#### IV. GRADUATE EDUCATION

The true value of the public health engineer rests squarely on his ability within his professional field.

Because of the wide difference in the technical knowledge required in the various fields of public health engineering activity, opportunity should be afforded for some specialization. Depending upon the student's preparation, a suitable program of graduate study should be developed from the following elements of sanitary science, engineering technology, and public health practice.

a. Sanitary sciences including (but not limited to): bacteriology, chemistry, parasitology, planktology, entomology and human

physiology as related to problems of public health engineering interest.

b. The principles and practices of engineering analysis, design and operation as applied to works and projects for the protection and promotion of the public health including (but not limited to) the following: water supply and purification, sewerage and sewage treatment, the collection and disposal of municipal, rural and industrial wastes; projects for the control of insect, rodent, and other vectors of disease transmission; the engineering and administrative phases of food and milk sanitation; the sanitation of buildings including ventilation, air conditioning, heating, plumbing, and illumination; housing; industrial sanitation with particular reference to those industrial health hazards the correction of which is largely an engineering problem.

c. The principles of public health including (but not limited to) the following: public health administration sufficient to give the student a clear understanding of the purposes, functions, and legal bases of the general public health program and the responsibilities of the engineer within that program; epidemiology and communicable disease control; statistical methods in sanitary engineering and public health practice.

Emphasis should be placed upon the fundamental scientific engineering and public health content of the subject matter presented—the student being supervised and guided in his development of possible techniques and practices based upon sound fundamental concepts.

The type of institution best fitted to give the instruction is a university which includes both a faculty of engineering and a faculty of public health, and in which close coöperation is maintained between the members of the two faculties who are responsible for instruction in public health engineering.

#### V. CLASSIFICATION OF PUBLIC HEALTH ENGINEERS

In any organization having a staff of engineers, classification is necessary. In general such classification automatically occurs and it is a general requirement under usual civil service procedures. However, lack of uni-

formity in classification exists among the various health agencies employing engineers. The following classification with educational and experience requirements is suggested. It is based on the requirements of several states, federal Civil Service, the United States Public Health Service for Commissioned Officers, and the classification of engineers as adopted by the American Society of Civil Engineers.

The education, training, and experience stated in the classification should be regarded as the minimum that is normally acceptable. It is not intended that the qualifications should be retroactive but rather that they should apply to the selection of new employees and serve as a guide in the future advancement of sanitary engineering personnel.

Because of the present limited supply of qualified public health engineers, it is proposed that in any grade, three years of acceptable experience in public health engineering under competent supervision may be substituted for the one year of graduate study set forth in this report. However, the advantages of specialized graduate study in the sound and early development of public health engineers for positions of responsibility are recognized. Therefore, as soon as practicable, at least one academic year of approved graduate study as described in Section IV should be made a basic requirement for appointment or promotion to Grade III or to higher grades in this classification.

#### *Education and Experience*

The minimum educational requirements for all grades are: (1) graduation in engineering from a college or university of recognized standing; (2) satisfaction of academic requirements for admission to examination for licensure to practise engineering in the particular state; and (3) completion of an approved undergraduate sanitary option or sanitary engineering program

or, lacking such training, an equivalent amount of postgraduate orientation. Such postgraduate training may consist of at least three months of approved university guidance; or a like period of well rounded and systematic in-service orientation and supervised practice. Tentative or provisional appointments may be authorized for graduate engineers without public health engineering training or experience to allow a sufficient period for graduate study or in-service training to qualify them for permanent classification.

With the exception of Grades I and II, specialized education should include, in addition to the minimum educational requirements, at least one academic year of graduate study in a recognized institution of learning leading to a graduate degree and with major study in sanitary science, sanitary engineering, and public health. In lieu of a year of graduate study, three years of suitable practice under the supervision of a competent public health engineer in public health work may be substituted *provided* that, (1) such substitutions of experience for graduate study normally should not be allowed for grades higher than Grade III, and (2) a sanitary engineer who later completes a year or more of graduate study should receive equivalent credit in his classification for the years of experience previously substituted in lieu of graduate study.

Attainment of the doctor's degree in sanitary engineering or in public health if based on special studies in the field of public health engineering in a school of recognized standing should be considered as the equivalent of and may be substituted for a part of the experience requirements of the classification below as follows: Grade III—one year; Grade IV—two years; and Grade V—three years.

#### *Classification*

The qualifications for each grade

should conform with the educational requirements or equivalent experience as described above in addition to the experience indicated below:

Grade I—No experience required.

Grade II—At least one year of suitable experience in sanitary engineering work under competent supervision.

Grade III—At least two years of suitable experience in sanitary engineering work in a grade comparable to Grade II, of which at least one year of the total experience must be in public health work. (Total 3 years sanitary engineering, 1 of them in a public health agency.)

Grade IV—At least two years of sanitary engineering experience in a grade comparable to Grade III, of which at least two years of the total experience must be in a responsible position in public health work. (Total 5 years sanitary engineering, 3 of them in public health agency.)

Grade V—At least five years of engineering experience in a grade comparable to Grade IV, of which at least five years of the total experience must be in a responsible position in public health work. (Total 10 years sanitary engineering, 5 of them in public health agency.)

### *Personal Qualities*

To attain success in full measure, public health engineers should not only be competent in their field of learning and practice but should also be able to establish and maintain favorable relations in their own department and with the public on the basis of creative ability, far-sighted leadership, sound

engineering judgment, common sense, honesty, and industry.

## VI. QUALIFICATIONS FOR DIRECTING PERSONNEL

### *Director*

The qualifications for the position of Director of a Division of Sanitation (however designated) in a health department will vary depending upon the size of the division and the responsibilities of the position. He should have the educational requirements set forth for all public health engineers, a general knowledge of all phases of public health engineering, and an intimate knowledge of those problems which are of importance in the particular area or community in which he is to be employed. He should have the ability to organize and direct the work of his division.

In small health units where only one employee is engaged in environmental sanitation activities, this employee should meet the qualifications of one of the public health engineering grades unless he is working under the technical direction of a public health engineer of the staff of an overlying governmental health agency.

### *Assistant Director*

An Assistant Director should have the qualifications for the next grade below that in which the director is classified.

## COMMITTEE ON PROFESSIONAL EDUCATION

WILLIAM P. SHEPARD, M.D., *Chairman*  
REGINALD M. ATWATER, M.D., *Secretary*  
GAYLORD W. ANDERSON, M.D.  
W. W. BAUER, M.D.  
ROBERT D. DEFRIES, M.D.  
EDWARD S. GODFREY, JR., M.D.  
PEARL McIVER, R.N.

GEORGE H. RAMSEY, M.D.  
LOWELL J. REED, Ph.D.  
WILSON G. SMILLIE, M.D.  
ERNEST L. STEBBINS, M.D.  
RALPH E. TARBETT, C.E.  
CLAIR E. TURNER, Dr.P.H.

The Advisory Group assisting with the preparation of this report, to whom the Committee on Professional Education expresses grateful appreciation, consisted of:

RALPH E. TARBETT, C.E., *Referee*  
H. E. BABBITT  
ERNEST BOYCE  
V. M. EHLERS  
GORDON M. FAIR

ALFRED H. FLETCHER \*  
ROY J. MORTON  
E. S. TISDALE  
H. A. WHITTAKER

\* During Mr. Tarbett's absence Mr. Fletcher served as Referee pro tem.

# Achievements of UNRRA as an International Health Organization

WILBUR A. SAWYER, M.D., LL.D., F.A.P.H.A.

*Director of Health, United Nations Relief and Rehabilitation Administration,  
Washington, D. C.*

SO astounding is the magnitude of the overall performance of the United Nations Relief and Rehabilitation Administration, with its mammoth shipments to war-ravaged countries of food, clothing, agricultural seeds, implements, and other essential supplies, that the strictly health functions are dwarfed by comparison. Nevertheless, in order to meet its responsibilities during the emergency, the Health Division of UNRRA had to expand until it became by far the largest international health organization which the world has yet seen. This is true even if the cooperating Division of Medical and Sanitation Supplies\* is not included.

The extent of UNRRA's operations was dramatically illustrated by a comment of Mr. Noel-Baker<sup>1</sup> at the recent session of the Council of UNRRA at Geneva:

During the war I was a Minister under Mr. Churchill in our Department of War Transport, and month by month I used to watch the convoys which brought to Britain the food and the raw materials with which we fought the war. The scale of UNRRA's supply operations each month is now equal to the total import programme of the United Kingdom in those historic times.

For UNRRA's entire period of active operations lasting about three years, the

total budget amounts to approximately 3 billion 7 hundred million dollars. When the Administration closes its books next year it is estimated that its health work will account for close to 168 million dollars. The largest portion of this amount, or about 146 million dollars, will have been spent for procurement and shipment of medical and sanitation supplies. By June 30, 1946, 105,000 tons of sera and vaccines, chemicals and drugs, hospital equipment, and laboratory supplies had already been dispatched, and about an equal amount was still to go forward. The estimate of 22 million dollars for the health activities exclusive of expenditures for supplies was reached by prorating the total estimated operational and administrative expenditures up to December 31, 1946, according to the numbers of international employees engaged in health and the number in the total functions and thus determining the share belonging to health.

The maximum annual expenditure of UNRRA for health is that for 1946, estimated as about 14 million dollars for the activities of the Health Division plus 68 million dollars for the procurement and shipment of medical and sanitation supplies. This gives an estimated sum of 82 million dollars for health, medicine, and sanitation during that year. The annual sum for health activities was substantially increased by allotments by certain governments from the proceeds of sales of part of their

---

\* The Division of Medical and Sanitation Supplies, responsible for procurement and distribution, is in the Bureau of Supply, while the Health Division, under the Director of Health, is in the Bureau of Services.

UNRRA supplies. Such sales to persons who could afford to buy were permitted on condition that the net proceeds in local currency should be turned back into relief and rehabilitation activities.

The size of UNRRA's effort in the field of international health can best be appreciated if we mention for comparison a few other important annual health budgets. The League of Nations Health Organization had the equivalent of U. S. \$414,078 in its largest annual budget, the one for 1931, and did valuable pioneering work with these resources. The Interim Commission of the World Health Organization is reported to have a budget of \$300,000 for the remainder of 1946 and \$1,000,000 for 1947. The International Health Division of the Rocke-

feller Foundation for the calendar year 1945 had a budget of \$2,200,000 for its regular program and expended also \$157,016 from the special war funds of the Rockefeller Foundation Health Commission. The United States Public Health Service has a total budget for the fiscal year ending June 30, 1947, of \$88,423,516, including \$290,700 for its new Office of International Health Relations. All the 48 states of the United States of America together appropriated about 50 million dollars for health for the year ending June 30, 1946, and the corresponding figure for the local governments is about 70 million. These comparisons bring out the magnitude of UNRRA's total expenditures for health. They had to be large because the requirements for relief health services and

TABLE 1

*International and Local Professional Health Personnel by Profession and Place of Duty  
June 30, 1946*

Place of Duty <sup>1</sup>	International Employees					Total	Local Employees
	Physicians	Dentists	Nurses	Sanitary Engineers	Other Professions		
Headquarters—Washington	7	0	2	1	4	14	0
European Regional Office	10	2	2	0	1	15	0
Albania	1	0	0	0	0	1	0
Austria	36	1	28	0	0	65 <sup>2</sup>	0
Belgium	1	0	1	0	0	2	3
Byelorussia	1	0	0	0	0	1	0
China	90	18	32	14	20	174 <sup>2</sup>	11
Czechoslovakia	1	0	0	0	0	1	1
Dodecanese	1	0	5	0	0	6	0
Ethiopia	1	0	2	1	0	4	0
France	2	0	0	0	0	2	2
Germany	280	7	348	4	1	640 <sup>2</sup>	43 <sup>4</sup>
Greece	27	1	52	8	26	114	79 <sup>5</sup>
Hungary	0	0	0	0	0	0	1
Italy	18	1	27	2	11	59 <sup>2</sup>	79 <sup>5</sup>
Middle East	4	0	9	2	2	17 <sup>2</sup>	1
Poland	4	0	2	2	1	9	4
Ukraine	1	0	0	0	0	1	0
Yugoslavia	4	0	2	2	1	9	5
	489	30	512	36	67	1,134 <sup>2</sup>	229
							1,134
Grand Total							1,363

<sup>1</sup> There was no professional health personnel in Finland, Korea, or the Philippines, where activity was exclusively on supplies.

<sup>2</sup> Occupied exclusively with Displaced Persons: Austria, 55, Germany 640, Italy 5, Middle East 17. Total 717.

<sup>3</sup> Including "program personnel" for clinical work and teaching, 113 (59 Physicians, 17 Dentists, 20 Nurses, 5 Sanitary Engineers, 12 Other).

<sup>4</sup> Including 34 Physicians and 9 Nurses.

<sup>5</sup> Including 20 Physicians, 19 Nurses, 24 Sanitary Engineers, and 16 Other.

<sup>6</sup> Including 25 Physicians, 10 Dentists, 44 Nurses

TABLE 2

*International Professional Health Personnel by Profession and Nationality  
June 30, 1946*

<i>Nationality</i>	<i>Physicians</i>	<i>Dentists</i>	<i>Nurses</i>	<i>Sanitary Engineers</i>	<i>Other Professions</i>	<i>Total</i>
Australia	7	0	12	0	0	19
Austria	2	0	1	0	0	3
Belgium	28	0	76	0	0	104
Bolivia	1	0	0	0	0	1
Brazil	9	0	0	1	0	10
Canada	8	1	28	0	2	39
China	1	0	0	0	0	1
Colombia	7	0	0	0	0	7
Cuba	13	1	0	0	0	14
Czechoslovakia	20	1	1	0	1	23
Denmark	9	0	43	0	1	53
Dominican Republic	1	0	0	1	0	2
Eire	18	0	21	0	0	39
El Salvador	2	0	0	0	0	2
Ecuador	1	0	0	0	0	1
France	51	0	50	0	0	101
Greece	6	0	0	1	0	7
Hawaii	1	0	0	1	0	2
Holland	13	0	68	0	1	82
Honduras	0	1	0	0	0	1
Iran	3	0	0	0	0	3
Italy	0	0	13	0	0	13
Luxembourg	3	0	1	0	0	4
Mexico	12	0	0	2	0	14
New Zealand	1	0	6	0	0	7
Norway	2	0	5	0	0	7
Palestine	3	0	0	0	0	3
Poland	31	0	2	0	1	34
South Africa	2	0	1	0	1	4
Stateless	10	0	3	0	0	13
Switzerland	8	0	4	0	0	12
U. K.	100	13	61	5	27	206
U. S.	90	13	106	25	29	263
USSR	1	0	0	0	0	1
Venezuela	3	0	0	0	0	3
Yugoslavia	3	0	0	0	1	4
Unknown	19	0	10	0	3	32
Totals	489	30	512	36	67	1,134

supplies were extreme at this time of unprecedented emergency.

#### THE STAFF OF THE HEALTH DIVISION

The professional staff of the Health Division at Headquarters in Washington; at the European Regional Office in London, in the China Office, in the displaced persons operations in Germany, and in the Missions to the several assisted countries, is shown by numbers, professions, and nationality in Tables 1 and 2, as of June 30, 1946. At that time recruitment of new personnel ceased and numbers were already beginning to decrease.

The recruitment of a large professional staff during the war was extremely

difficult. In Great Britain and the United States, military needs had priority. Many other areas which were drawn on later were at first inaccessible. The Surgeon General of the United States Public Health Service and the Chief Medical Officer of the British Ministry of Health appreciated the international importance of the health activities of UNRRA and helped arrange for the temporary release of experienced personnel from positions in their countries. The U. S. Public Health Service also assigned many of its commissioned officers to service with UNRRA and in September, 1946, there still remained on duty with the Health Division 34 medical and 4 dental of-



ficers, 66 nurses, and 16 sanitary engineers.

The international professional staff was recruited principally from the 48 nations now participating in UNRRA and on as broad an international basis as possible. From Table 2 it will be seen that the 1,134 professional persons in the international ("Class I") category, included nationals of 35 countries and a few classified as stateless or unknown. The posts of greater responsibility were also widely distributed among the nations, as will be illustrated by a few examples. At Headquarters in Washington, the Director of Health came from the United States, the Deputy Director of Health from Czechoslovakia, the Chief of the Far Eastern Branch from China, the Chief of the Epidemic Control Branch from Brazil, and the Chief of the Branch of Medical and Sanitation Supplies from the United Kingdom. In the European Regional Office, the Regional Director of Health is from the United Kingdom, his Deputy from the United States, and the Chief of the Branch on Medical Services to Displaced Persons from France.

Chief Medical Officers for Country Missions and the China Office have been drawn from many countries; to cite only a few examples, from Yugoslavia for China, from Greece for Ethiopia, from the United States for Poland, and from the United Kingdom for Italy and Greece. The Chief Field Medical Officer in China is from El Salvador.

The international doctors and nurses fall into two categories, those with public health training and experience and those primarily concerned with the care of the sick. The public health group was invaluable in the administrative and supervisory offices, and in field work in their specialties. Most of the clinical staff were assigned to assembly centers for displaced persons or to hospitals and clinics for the general population, although a few were primarily

engaged in teaching and demonstration. The volume of accomplishment was far beyond what the size of the UNRRA staff would indicate, for staff members worked side by side with a much larger personnel of the local health departments and medical institutions. In China, coöperation by the Health Division was facilitated by a parallel organization, the Health Commission of the Chinese National Relief and Rehabilitation Administration. In the 15 regions, the UNRRA personnel coöperated with their Chinese opposites in a combined effort to restore public health and medical activity to at least pre-war effectiveness as rapidly as possible.

Several hundred doctors and dentists found among the displaced persons were asked by UNRRA to help care for their fellows in the assembly centers. For example, in the British and United States occupation zones of Germany at the end of July, 1946, there were 152 dental clinics staffed by 311 dentists, nearly all displaced persons.

Certain principles determined whether a country desiring assistance needed a Mission and health services. Such assistance was available to invaded countries seriously damaged, and finally liberated from the enemy, which did not have enough foreign exchange to purchase the imports they needed. This was the case with Greece, Poland, Czechoslovakia, Yugoslavia, Albania, Ethiopia, China, Byelorussia, and the Ukraine.

Work was done also in ex-enemy countries under conditions determined by the UNRRA Council. These were Italy, Austria, and Hungary. In Germany, UNRRA assistance was given solely in the care of displaced persons. Limited assistance was given to the Dodecanese, Finland, Korea, and the Philippines.

In the assisted countries, the health staff, headed by a chief medical officer, is an integral part of an UNRRA Coun-

try Mission, and is under the overall direction of the Chief of Mission and his deputies. For technical guidance and general health policies there is, nevertheless, a close dependence on regional offices and headquarters. The international professional health staff in a Country Mission varies from one medical officer in Czechoslovakia and the Ukraine, for example, to 174 professionally trained people in China. However, what we have come to think of as a "standard mission," has at least a chief medical officer with public health training, a chief public health nurse, and a chief sanitary engineer at Mission headquarters, with field personnel in the districts assigned according to need. The large staff of 640 persons in Germany is occupied only with the care and health protection of displaced persons. Similarly engaged are 55 persons in Austria (29 physicians, 26 nurses), 5 in Italy (3 physicians, 1 sanitary engineer, and 1 nurse) and all 17 of the persons in the Middle East.

#### ORIGIN AND FUNCTIONS OF THE HEALTH DIVISION

When the future historian evaluates the work of UNRRA's Health Division, he will probably attribute greater significance to its service in bridging the war-caused gap in the evolution of international health organization than to its relief operations of a purely emergency nature. Many of the national health departments, on which the world health structure must rest, were inhibited or broken by the most widespread and destructive of all wars. There was an unprecedented shortage of materials, apparatus, transportation, communications and buildings essential to the protection of health and the maintenance of medical care. There was, in addition, disorganization, loss of trained personnel, and isolation from the newer health knowledge. The international bodies such as the League of Nations

Health Organization and the International Office of Public Health in Paris, to which the affected national health departments would naturally turn for guidance and leadership, were cut off from most of their field of activity and were largely prevented from functioning. The International Health Division of the Rockefeller Foundation had been forced to terminate most of its activities in Europe, and had as a result deflected more of its attention to South America. The Pan American Sanitary Bureau, operating only in the Americas, was less disturbed. The experiences of these organizations, and the experts they had trained, were most valuable for the restoration of health departments in the liberated countries and in carrying forward the health work of UNRRA.

To face the challenging situation, UNRRA's Health Division was created in December, 1943. Forty-four nations had signed an agreement on November 9 establishing the United Nations Relief and Rehabilitation Administration. The Health Division started operations shortly after the first Council session, meeting in Atlantic City, had laid down in detail the purposes and objectives of the new agency, and had given it the necessary framework of instructions and authority.<sup>2</sup>

The functions of the Health Division may be summarized briefly as follows:

1. Assistance to national health authorities
  - a. in the prevention of war-engendered epidemics,
  - b. in the rapid restoration of national health departments,
  - c. by assignment of technical staff for consultation and coöperation,
  - d. in determining the requirements in medical and sanitary supplies to replace losses through destruction, looting, and the cutting off of sources, and in coöperating with UNRRA's Bureau of Supply in related technical matters of procurement and distribution.
2. Revision and administration of international sanitary conventions for maritime and aerial quarantine, as applied to signatory mem-

bers of the United Nations, and the carrying out of the specific duties imposed on UNRRA by the revised conventions.

3. Provision and technical supervision of medical and sanitary personnel for the care and health protection of persons displaced by war wherever UNRRA has responsibility for them in assembly centers, or camps, or during travel back to their countries.
4. Training of professional health and medical personnel of the assisted countries, in preparation for relief and rehabilitation work, through study fellowships in foreign lands and by supplying teachers and lecturers for courses in the assisted countries.

#### PREVENTION OF EPIDEMICS

The great wars of history have been accompanied and followed by sweeping epidemics, usually directly related to the devastation and hardship. In the recent World War, since the destruction was more widespread than ever before, the greatest catastrophes were to be expected. Multitudes of people were being driven from place to place. Thousands were crowding into makeshift dwellings. Scarcity of food, clothing, medical care, and even of pure drinking water was almost universal. And most of the health departments that had survived the war had been completely disrupted and so largely deprived of necessary personnel and supplies that they were quite ineffectual.

The only hope of avoiding major health disasters lay in the advances in medical science made since the previous World War and in early organization to apply this new knowledge effectively.

Appreciating the appalling risks to world health, the Council of UNRRA gave the Health Division a wider mandate with regard to epidemic prevention than in its other fields of activity. It authorized measures to control epidemics not only in liberated areas but also in enemy and ex-enemy countries with the purpose of preventing the spread of such epidemics to United Nations areas or to displaced persons of United Nations nationality.

Of the war-engendered epidemics to be expected, the one that presented the most alarming threat was typhus fever. Consequently, the Health Division felt the highest degree of responsibility for curbing it. Without control, widespread epidemics of typhus were inevitable. With control, safety was possible because of the effective new weapons which had been developed against the disease. UNRRA was in a position not only to secure and distribute vast quantities of DDT delousing powder, but through its field staff it could give directions as to the method of application.

The results have been highly gratifying. No great runaway epidemics of typhus have occurred as the result of the recent war. Credit must be given first to those who devised the practical and effective methods of delousing fully clothed persons by powdering with DDT. The Bureau of Entomology of the U. S. Department of Agriculture, the International Health Division of the Rockefeller Foundation, and the United States of America Typhus Commission all contributed invaluable evidence obtained through experiments and field trials. Before UNRRA had free access to some of the critical areas, the occupying armies, the U. S. A. Typhus Commission, and the International Red Cross here and there helped the local health authorities to keep the situation in check. As soon as the shipping lanes were cleared, UNRRA dispatched thousands of tons of DDT powder and many hundreds of dust pumps. UNRRA staff was sent in to help organize control and to give instruction in methods. A limited amount of typhus vaccine was supplied also but it was not used on a large scale in the general population, and therefore played only a secondary rôle. The size of UNRRA's effort is disclosed by the large amount of 10 per cent DDT delousing powder which is being distributed to the various countries, as shown in the first column of

TABLE 3

*Total Program for Shipping DDT, by Recipient Countries*

Recipient Country	For Typhus Control	For Malaria Control		
	10% DDT Powder	20% DDT Solution	26% DDT Solution	100% DDT Powder
	In Pounds	In Gallons	In Gallons	In Pounds
Albania	198,100	39,000	50,000	24,000
China	2,394,410	....	130,000	250,000
Czechoslovakia	216,040	....	....	6,450
Ethiopia	170,000	....	4,000	....
Greece	205,175	275,204	253,000	533,100
Hungary	8,900	....	....	....
Italy	224,640	....	225,000	406,000
Korea	100,000	....	....	....
Philippines	....	....	....	20,000
Poland	2,014,980	....	....	157,525
Yugoslavia	1,254,236	90,000	270,000	55,000
Totals	6,786,481 (3,393 tons)	404,204	932,000	1,452,075

Table 3. The other columns showing the amounts of DDT being shipped for use in malaria control will be referred to later. A single dusting of one person requires about 2 ounces of the 10 per cent DDT delousing powder, and it is effective for several weeks.

Probably the most practical estimate of the general results of the campaigns against typhus can be obtained by comparing the typhus incidence in Poland in the years 1919 and 1920, immediately after World War I, with the available figures for part of the corresponding period of 1945 and 1946, after World War II. This is done in Table 4 and Chart 1.

In 1919, the maximum monthly inci-

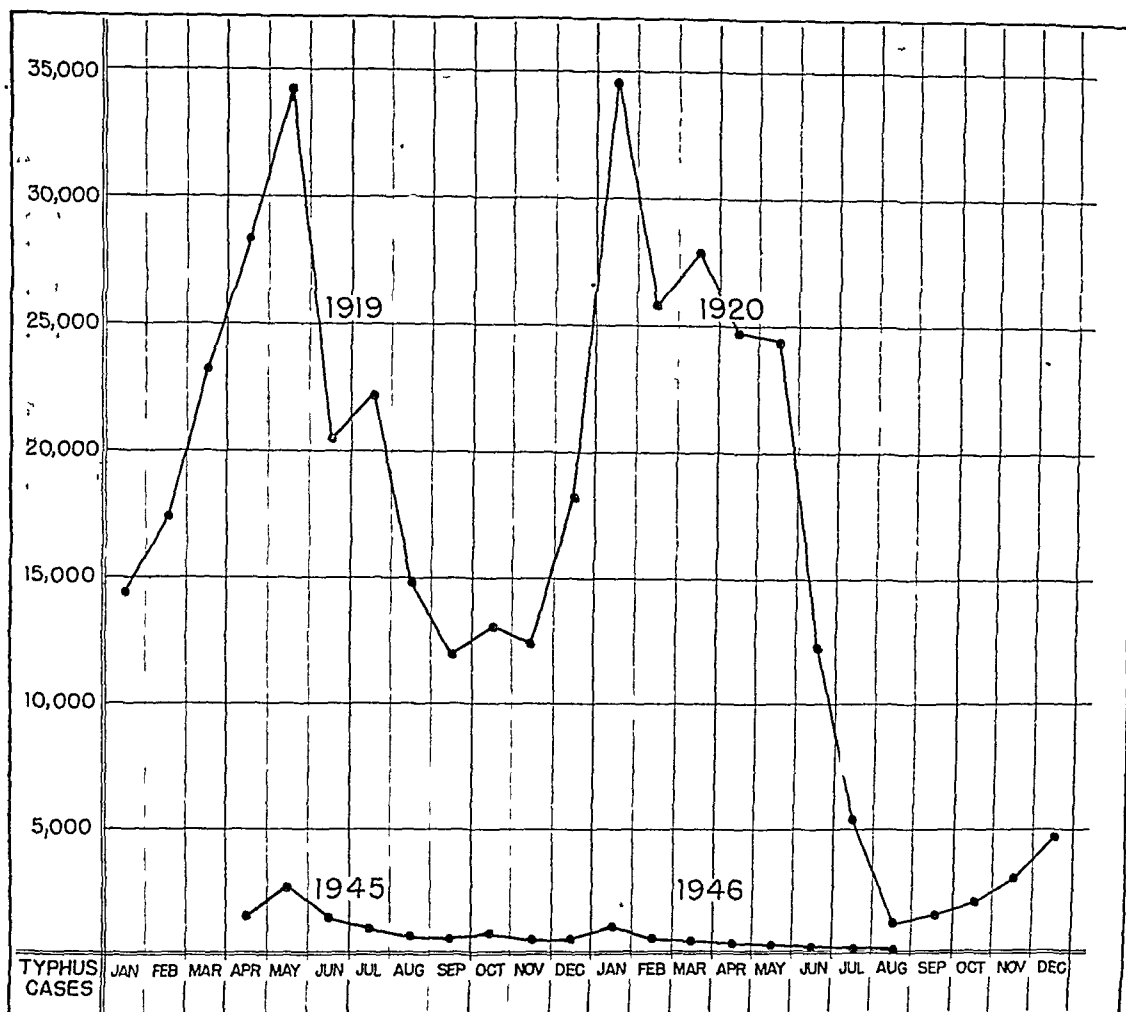
dence was 33,929 cases in May. For 1945 our reported figures began with April, and the comparable peak seems to have been reached also in May with 2,987 cases, or less than one-eleventh as many as in May, 1919. In 1920 and the early part of 1946, the corresponding maximum figures, both of them in January, were 34,530 and 1,235, giving a ratio of approximately 28 to 1. The data for 1919-1920 are for Congress Poland and Galicia only, while those for 1945-1946 relate to the present territory of Poland, including the three former German provinces which came under Polish administration in September, 1945. Eastern Galicia is therefore excluded in the later period, but Poland,

TABLE 4

*Typhus Fever in Poland, 1919-1920 and 1945-1946*

	Number of Cases		Number of Cases	
	1919	1920	1945	1946
January	14,207	34,530	....	1,235
February	17,061	25,858	....	635
March	23,272	27,843	....	516
April	28,190	24,616	1,867	417
May	33,929	24,339	2,987	221
June	20,445	12,329	1,795	89
July	22,287	5,366	1,536	99
August	14,735	1,388	794	78
September	11,986	1,650	782	47
October	12,980	2,195	869	....
November	12,382	3,013	601	....
December	18,333	4,576	682	....

CHART 1—Typhus fever incidence in Poland after World War I in comparison with the incidence after World War II



west of the German frontier of 1914 is included, which makes the two sets of figures fairly comparable. Moreover, the differences observed in the comparisons are so great that we are not attempting here to make allowances for changes of area or population. It is evident from the chart that typhus in Poland is being conquered and that the war emergency with respect to this disease is over. In fact, we are given hope that Poland could exterminate typhus before long by the modern methods which have been introduced. This result could be hastened by international planning with participation by Poland's neighbors as well.

A flare-up of typhus fever in Yugo-

slavia was also to be expected, for it was in Serbia that the great epidemic of 1915 occurred early in the previous World War. During that visitation, over 150,000 people died of typhus within a period of 6 months, and the daily admissions for typhus to military hospitals alone rose to the staggering height of 2,500. Nothing comparable was permitted to occur in the recent war, although the disease was epidemic in Croatia and Serbia before effective control could be initiated. The U. S. of America Typhus Commission was invited early to Yugoslavia to help control typhus. The Commission organized control by DDT dusting and vaccination and trained many persons in the

methods. Later UNRRA took over and continued to advise and to provide the necessary supplies. Typhus in Yugoslavia is steadily responding to control. There were about 50,000 cases in 1945, but only 3,000 in the first half of 1946.

The same rosy picture cannot be painted for another serious preventable disease. During my visit to Poland in November and December, 1945, I was astounded at the amount of typhoid fever then present. It was being largely attributed to the great amount of migration and to contact between cases. Unfortunately, we had no new techniques, comparable to the use of DDT in a dust gun, that could be used for combating epidemics of typhoid. Since then the Health Division has assigned

two sanitary engineers to its Poland Mission in the hope that they can assist the trained sanitary engineers of the Ministry of Health in discovering and correcting some of the responsible conditions in the post-war environment.

In Table 5 and Chart 2 is shown for comparison the monthly incidence of typhoid and typhus fevers from April, 1945, to August, 1946. The great seriousness of typhoid and the present low incidence of typhus are clearly shown. The typhoid fever maximum in October, 1945, was 17,629 cases and the peak in May of the same year for typhus was only 2,987 cases. The three former German provinces now under Polish administration are included only from September, 1945. Later returns show

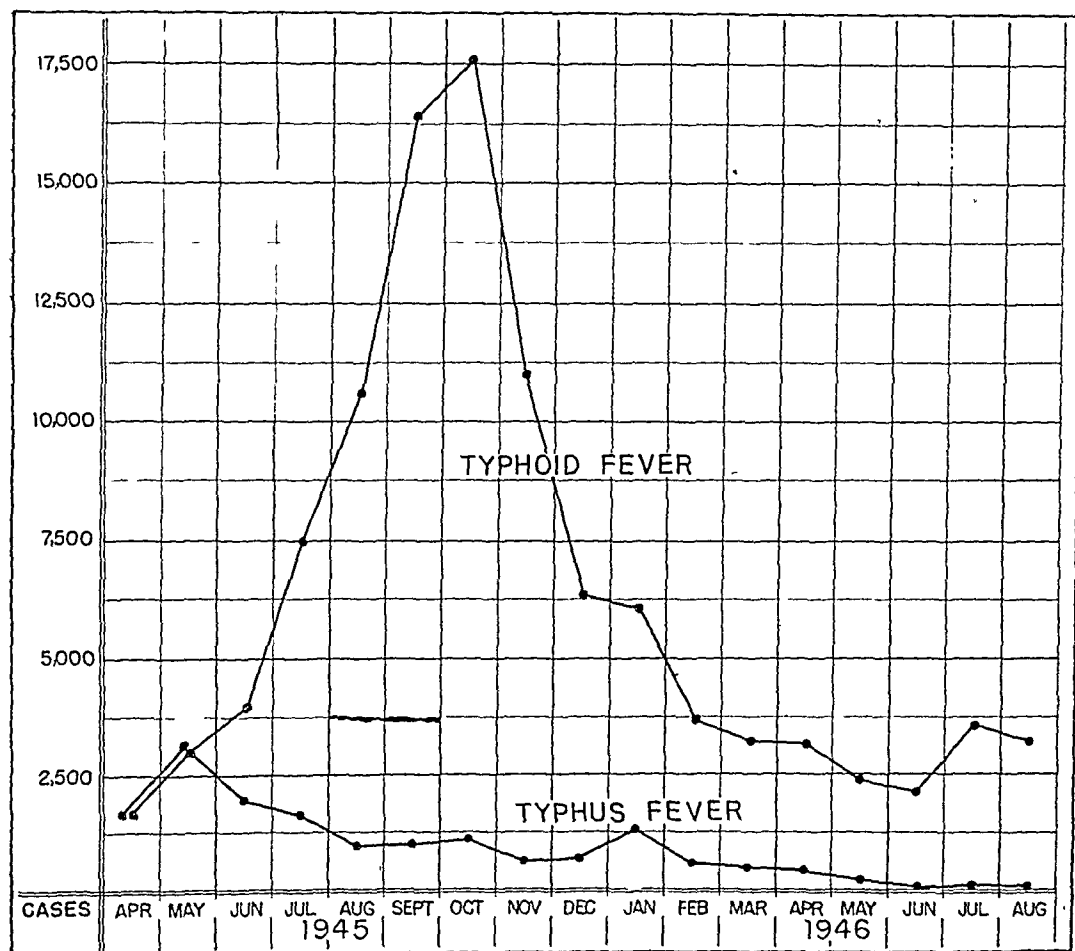


CHART 2—Comparison of typhoid fever and typhus fever incidence in Poland, April, 1945–August, 1946

TABLE 5

*Typhus and Typhoid Fever in Poland,  
April, 1945–August, 1946*

	Number of Cases	
	<i>Typhoid Fever</i>	<i>Typhus</i>
April, 1945	1,871	1,867
May	2,825	2,987
June	3,835	1,795
July	7,457	1,536
August	10,628	794
September	16,569	782
October	17,629	869
November	10,999	601
December	6,345	682
January, 1946	5,983	1,235
February	3,551	635
March	3,180	516
April	3,110	417
May	2,335	221
June	2,088	89
July	3,475	99
August	2,680	78
September	2,605*	47*

\* Provisional figures

that typhoid seems definitely to be coming under control.

The war and post-war conditions that brought a marked increase in the prevalence of typhoid fever in countries of continental Europe would have spread cholera also, had it not been completely absent. In fact, the disease had not extended west of Iran since 1931. In China, on the other hand, cholera is endemic and was quite active in the summer season of 1946.<sup>3</sup> UNRRA was first called on for emergency help in fighting cholera in June of the previous

year when an epidemic was developing in Chungking. An UNRRA team of 7 physicians and 2 sanitary engineers, with 6 tons of needed medical supplies, was flown to India and over the Hump to that city. Unfortunately, one installment of the supplies was lost over the Himalayas. The team took part in the control of the epidemic and the care of the sick.<sup>4</sup>

Early in March of this year (1946), I saw in the Contagious Disease Hospital of Canton the first five cases of cholera of the recent epidemic. Subsequently, other cities of China were involved successively. The experience of the larger ones is shown in Table 6. By mid-summer, cholera became active also in southern Manchuria, where it flared up in numerous localities. In July alone, 11,910 cases and 4,697 deaths were reported from 26 cities and 2 rural areas of Manchuria.

Assistance to the Chinese authorities in the control and treatment of cholera has been promptly given by the medical staff of UNRRA. Cholera vaccine for mass immunization, and even calcium hypochlorite for water purification, were flown to Canton early in its epidemic. Since then several emergency shipments of material necessary for fighting cholera and for treating the sick with intravenous salt solution and plasma have been sent by air directly to China from

TABLE 6

*Cholera Cases in Certain Chinese Cities, 1946*

<i>Month</i>	<i>Canton</i>	<i>Shanghai</i>	<i>Nanking</i>	<i>Foochow</i>
March	548	0	0	0
April	1,196	0 †	0 †	0
May	853	27 †	0 †	0
June	1,097	816	4	22
July	250	2,468	209	422
August	37	933	300	204
September	22 *	171	22	44 *
Total, Cases	4,003	4,415	535	692
Deaths	1,208	352	31	133
Case Mortality per cent	30.2	8.0	5.8	19.2
Population in thousands	1,000	3,500	700	325

\* 20 days only

† Excluding imported cases

Toledo, Ohio. In Shanghai, two million cholera vaccinations had been performed by early July and this may have been one reason that the epidemic was losing momentum by the middle of that month. Investigations in connection with the cholera epidemics in Canton and Shanghai were carried out by an epidemiologist of the China Office.

Plague was almost completely kept out of the European post-war picture. It gained entry to the port of Taranto in southern Italy when the disease was present in the island of Malta. From September 3, 1945, to October 25, there were 25 cases in Taranto with 12 deaths. An anti-rat campaign was initiated. All the premises in the infected area were sprayed with 5 per cent DDT in kerosene to kill the potentially infected fleas, and about 20,000 workers were dusted weekly with 10 per cent DDT powder. UNRRA, as part of its coöperation, made available the advice of an expert on rat extermination. There was no spread to other cities.

In China, plague was a greater problem, but there was no really extensive epidemic after the country was liberated and opened to UNRRA. Since then, the focus centering in Fukien Province has been active.<sup>5</sup> In the early months of 1946, there was much concern over reports from Mukden of pneumonic plague in Manchuria. There were 39 cases with 36 deaths, and the recovery of 3 was attributed to treatment with sulfadiazine. This small outbreak stopped abruptly, but there were 13 additional fatal cases of plague early in March about 70 miles from Mukden. The National Health Administration is continuing the study and control of plague in the Fukien area, using supplies sent by UNRRA, such as plague vaccine, sulfadiazine, DDT for killing fleas, and poison for rats. UNRRA has also assigned to this work a team consisting of an epidemiologist, an entomologist, and a sanitary engineer.

Since Kala-azar is a disease transmitted by a bloodsucking fly, a species of *Phlebotomus*, it can hardly be regarded as a result of the war, although aggravated by the resulting neglect. There are about three hundred thousand persons near the Yellow River in Honan, Kiangsu, and neighboring Provinces, who have this serious disease in acute form and urgently need treatment. They have been cut off by the war from the source of supply of the antimony drugs that would cure them. UNRRA's Chief Medical Officer in China has urged that for the time being these drugs be given priority over all other medical supplies in shipments to China. Unfortunately, the world's entire manufacturing capacity for antimony drugs is not enough to fill the needs promptly and it is proving necessary to bring about the expansion of the facilities for production. The medical officers of UNRRA and CNRRA are not satisfied to limit their program to treatment alone and are hoping to use DDT supplied by UNRRA in an attack on the *Phlebotomus* responsible for transmitting the disease, thus, initiating a program of real prevention. This may not get into full swing until more is known of the insect and its habits.

For several years, diphtheria has been the leading epidemic disease in a large part of Europe.<sup>6</sup> Great quantities of diphtheria toxoid for immunization and antitoxin for treatment are being shipped by UNRRA to the assisted countries. The amount of diphtheria toxoid in the supply program is 6,015,960 ml., or enough to immunize 2,406,384 persons. Diphtheria antitoxin is being supplied up to a total amount of 5,167,080,000 units. Material for the Schick test also is provided.

#### CURBING ENDEMIC DISEASES

The incidence of tuberculosis has gone up so high in the war-ravaged countries that this disease presents a serious and



lasting post-war problem, as it did after the first world war. Tuberculosis experts on UNRRA's staff have made surveys in many countries, using mass radiography, have analyzed the problem, have given advice as to the control of the disease, and have assisted in restoring and correcting the institutions for the tuberculous. Such a program has reached an advanced stage in Greece, for example, but is still far from complete.<sup>7</sup> The Greece Mission has a Chief Tuberculosis Consultant and under him are five area teams, each consisting of a tuberculosis specialist, nurses experienced in this disease, a radiologist, and a clerk. These teams travel from village to village, examining people to determine the extent of the problem, inspecting sanatoria and helping set up clinics, advising the authorities, and training technicians in the use of radiographic units. Some 70,000 persons have already been examined by mass miniature radiography. When tuberculosis has been dependably diagnosed, an effort is made to arrange for supplementary rations. Interest has been stimulated, an advisory National Tuberculosis Council has been organized, and there is large-scale coöperation from voluntary agencies. Supplies from UNRRA have been given to nearly every sanatorium and dispensary in Greece. Such supplies range from bedsteads and x-ray apparatus to drugs and special surgical instruments. All this is of great assistance to the governmental health authorities, who are facing an otherwise insuperable problem, for in Greece as in the other liberated countries the surveys reveal a marked increase in tuberculosis.

The results of the tuberculosis survey in Poland have been published by an UNRRA specialist.<sup>8</sup> He reports that the restoration of the sanatoria is going ahead and that much equipment has come from UNRRA. In Italy, the war against tuberculosis is benefitting not

only from the UNRRA surveys and equipment but also from generous allotments by the government from the proceeds of sales of UNRRA supplies.

Wars produce a marked increase in venereal diseases, and World War II was no exception. Fortunately, treatment has become much more effective in recent years, and the knowledge of methods of control has also advanced. UNRRA has supplied large quantities of drugs useful in treating diseases of this class and has supplied information about their use. A specialist in venereal disease control and treatment has been attached to the UNRRA Mission in Poland, and several of the other medical officers possess special knowledge and experience in this field.

In the treatment and control of many diseases beside those here mentioned, there is a growing dependence on specific and effective drugs. Many of the older effective drugs were not generally available in the occupied countries during the war. The more recent ones were not known when the war started and had not been brought in when UNRRA began operations. The physicians and health officers were eager to get the newer drugs and biologicals and information regarding their effectiveness, safety, and methods of use. To illustrate the quantities in which drugs were supplied by UNRRA, I shall give a few items from UNRRA's total procurement program for the assisted countries: penicillin, 809,550 million units; insulin, 663,690 thousand units; various sulfa drugs, 1,074,265 lbs.; acetyl-salicylic acid (aspirin), 1,207,000 lbs.

#### CAMPAIGNS AGAINST MALARIA

Several of the liberated countries assisted by UNRRA have suffered long and intensely from malaria. The war increased the problem by disrupting drainage systems, depriving the public of suppressive and curative drugs, and in general interrupting the existing

activities against malaria. An extraordinary opportunity for widespread and systematic malaria control presented itself to the Health Division after these countries were liberated, and no time was lost by the sanitary engineers of the Division in organizing the field operations. The new methods which made cheaper and more effective control possible were the residual spraying of houses with DDT solution to destroy the adult mosquitoes and the distribution of the same insecticide from hand pumps or airplanes on water surfaces to kill the larvae.

The largest of the campaigns planned by UNRRA personnel in cooperation with the governmental health authorities were in Italy and Greece. The results were highly successful and the procedures were most popular. Not only did mosquitoes diminish and malaria almost disappear, but there was also a heavy incidental mortality among houseflies, bedbugs and fleas.

The campaigns in Italy were carried out with the approval of the High Commissioner of Hygiene and Public Health and with the cooperation of the Provincial Medical Officers and the anti-malaria committees. The program depended mainly on residual spraying. It began in Sicily in January, 1946, and was continued first in Frosinone, then in the highly malarious strip of the south coast of Central Italy, and finally in the delta of the River Po. In the entire operation, the Italy Mission of UNRRA supplied technical supervision through its engineers. Moreover, it furnished 21 vehicles, 50 tons of pure DDT, 216,000 gallons of kerosene, 8,000 gallons of concentrated DDT emulsion, and the necessary sprayers. Twenty-five to 150 persons were engaged in spraying in each of the areas treated. These areas had an extent of 1,890 square miles and included about one-third of the total malarious territory of Italy, excluding Sardinia. The num-

ber of houses sprayed was 50,000; other structures similarly treated numbered 143,000; and the total area of internal wall space sprayed was 31,405,049 square meters. The good results gave rise to the prediction that a similar scheme of operations applied to all the malarious areas in future years could reduce malaria until it ceased to be a problem.

The preliminary work of an attempt to eliminate malaria from Sardinia by exterminating the anopheline species responsible for transmission has been started. This will be a joint project of the Government of Italy, the International Health Division of the Rockefeller Foundation, and UNRRA. The International Health Division is supplying the directing scientific staff, the Government is allotting funds for expenses from the proceeds of the sale of UNRRA supplies, and UNRRA is making available motor equipment, DDT, and other materials. Encouraged by the successes in eliminating *Anopheles gambiae* from Brazil and southern Egypt, the directors of the project are hopeful that a similar drive on the European anophelines responsible for transmitting malaria in this isolated island will result in their complete and permanent elimination.

The campaign against malaria in Greece was nation-wide from the start, and was planned and directed by the Chief Sanitary Engineer of the UNRRA Mission in cooperation with the Greek health officials. The methods all involved the use of DDT and included residual spraying of houses, distributing an oil solution of this larvicide by hand pump on small mosquito breeding places near malarious villages, and applying 20 per cent DDT as a thermal aerosol to large and inaccessible breeding places from 10 specially equipped airplanes. It is estimated that approximately 300 tons of DDT, in terms of the pure chemical, will have been used during

1946, or most of the supply designated for Greece in Table 3. For administrative purposes Greece was divided into 11 regions, in each of which there were an UNRRA medical officer and a sanitary engineer who worked in close co-operation with a Greek Government malariologist and a sanitary engineer. Seventeen planes were supplied by UNRRA, of which 10 are used in the regions. The other 7 are used for training pilots, for inspection trips, and as a source of replacement parts. Each plane can treat 17 acres per minute, and approximately 285,440 acres of mosquito breeding surface have been treated, counting each area every time it is gone over. The interval between treatments is about 15 days. This amount of operation by airplanes has required 17,840 gallons of 20 per cent DDT. Residual spraying has been applied to over 4,000 villages and towns to approximately 300,000 houses, stables, and other diurnal resting places for mosquitoes. The results of the combined methods seem to have been excellent and the people are enthusiastic. The fall survey should give a more accurate estimate of the reduction in malaria and its mosquito vectors.

The malaria experience of the Health Division seems to have demonstrated that it has at last become practicable and economical to control malaria on a national scale.

#### VARIOUS OTHER ACTIVITIES

It is natural that nutrition should be a prime interest of the Health Division in view of UNRRA's great responsibility to supply food under its relief program. Medical Nutrition Consultants and Dietitians of the Health Division made many surveys of the physical condition and diets of population groups suffering from food deprivation. Their primary duty was to report on the current state of nutritional health and to advise on matters of food and nutrition. The de-

tailed survey for Italy has already been published.<sup>9</sup> Some of the specialists made observations of acute starvation in Germany, Holland, and China. One of them organized a group of about 100 medical students and directed their efforts to save starving inmates of Belsen Camp by scientific methods.

In Italy, in addition to the study cited above, there was an extensive survey by the Italian Medical Nutrition Mission sent out by the Unitarian Service Committee and the Congregational-Christian Service Committee with the coöperation of UNRRA. They undertook to find out, by experimental feeding of malnourished children, what important food elements were most lacking, and to advise UNRRA as to needed supplements to the diets being supplied to hospitals. This team of medical scientists and laboratory technicians worked from April, 1945, to March, 1946, in six different parts of the country. It examined 28,651 persons, and gave service to 1,984.

In China, five CNRRA-UNRRA nutrition teams investigated the famine areas to determine their nature and extent. The results confirmed the existence of acute famine and general low caloric and protein intake, especially in Hunan Province. As a follow-up, special emergency supplies, including vitamin products and serum protein, were flown in from Shanghai. In the meanwhile every attempt was being made to hasten the sending of quantities of food.

The general conclusions in the reports from all countries investigated seemed to be that 'various degrees of underfeeding were encountered, sometimes actual starvation, but that frank deficiency diseases, such as scurvy, pellagra, rickets, and beriberi, were less frequent than would be expected. Of these diseases, rickets is the one most frequently encountered.

Consultants in maternal and child

health have made surveys and advised the governments and Missions. A school feeding program is a prominent feature in the Greek program, and the preschool children also receive attention.

Dental consultants have surveyed the needs in the several countries for dental care and have given special attention to the organization of dental services in assembly centers for displaced persons. The dental consultant attached to the European Regional Office has given lectures and demonstrations to the local dental profession.

The medical and surgical side of the rehabilitation of the disabled is a responsibility of the Health Division, although the other aspects have fallen to welfare workers and voluntary agencies. In Athens, a rehabilitation center has been sponsored by the Greek Government, UNRRA, and the Near East Foundation. The Health Division has provided an orthopedic surgeon consultant. Artificial limbs and materials for local manufacture and repair are being supplied.

A series of UNRRA facio-maxillary surgery teams was sent to Yugoslavia from London. The first, consisting of 6 persons, arrived near the end of 1945. These teams demonstrated the latest techniques for correcting mutilation, and trained local surgeons and nurses.

In many projects which have been mentioned voluntary agencies took an effective part. This was especially the case in the work with displaced persons in the Middle East Camps and in Germany. Voluntary agencies provided health personnel numbering about 500 for work in Europe and an additional number for China. They also contributed medical supplies for devastated areas.

#### INTERNATIONAL SANITARY CONVENTIONS

The occupation of France isolated the International Office of Public Health and interfered with its administration of the International Sanitary Conven-

tion of 1926 (Maritime) and the International Sanitary Convention for Aerial Navigation of 1933. This left international quarantine in so serious a predicament that something had to be done about it. To meet the situation UNRRA's Standing Technical Subcommittee on Health for Europe promptly appointed an Expert Commission on Quarantine to draft international sanitary agreements of an emergency nature.<sup>10</sup> The Commission later submitted to the Standing Technical Committee on Health in Washington drafts for two conventions, modifying and modernizing the existing ones. Each draft provided that UNRRA should carry out the duties previously assigned to the International Office of Public Health in Paris. After some modification in the light of the comments of member governments, UNRRA approved the proposed conventions and they were opened for signature at the State Department of the United States of America, the depository of the conventions. The required number of signatures was reached on January 15, 1945. The two conventions of 1944 came into effect on that date and have been administered since then by the Health Division from the Headquarters of UNRRA in Washington, with the European Regional Office in London acting as a branch for the regions in its sphere—Europe, Africa, and the Middle East. Headquarters makes notifications directly to China, Australia, New Zealand, Canada, and the United States, and through the Pan American Sanitary Bureau to the other American republics.

At Headquarters, the Division is publishing the semi-monthly *Epidemiological Information Bulletin*, carrying disease reports and epidemiological analyses. The European Regional Office is bringing out an additional fortnightly *Bulletin of Communicable Diseases and Medical Notes* for distribution to the governments in its area. A small *Weekly*

*Epidemiological Bulletin* is also sent out from London in printed form to give prompter information regarding the appearance and movements of serious diseases. Most of the reports to and from both offices with regard to pestilential diseases are transmitted by cable.

The duties imposed by the 1944 convention for aerial navigation include the delineation of the yellow fever areas of the world for purposes of quarantine, and also laying down standards for yellow fever vaccine and designating institutes approved for carrying out tests of the vaccines. These special functions have been performed by an Expert Commission on Quarantine appointed by the Standing Technical Committee on Health. In 1946 the Commission carried out an exhaustive test of the immunizing properties of the Dakar yellow fever vaccine administered by scarification, alone or mixed with smallpox vaccine. The Commission recommended that the method be certified as acceptable in the issuance and recognition of international certificates of inoculation.

All the duties imposed on UNRRA by the International Sanitary Conventions of 1944 and the Protocols prolonging them were of temporary and emergency nature. They will, therefore, be transferred to the Interim Commission of the World Health Organization on December 1, 1946, as agreed in letters exchanged by Mr. F. H. LaGuardia, Director General of UNRRA, and Dr. G. Brock Chisholm, Executive Secretary of the Interim Commission. Although the Central Headquarters of the Interim Commission will remain in New York, according to latest advice, the Epidemiological Office in charge of the administration of the conventions will be in Geneva.

The last issue of the *Epidemiological Information Bulletin* will appear on December 15. The two complete volumes will form a valuable compilation of statistics for reference with

regard to the war and post-war period. Complete sets can still be made available to libraries and institutions requiring them.

#### MEDICAL CARE AND HEALTH PROTECTION OF DISPLACED PERSONS

In May of 1944, the responsibility for the six refugee camps in the Middle East was assumed by UNRRA. At the end of March, 1945, there were about 40,000 displaced persons in these camps, including nearly 15,000 children. The health staff contained specialists in nutrition, dietetics, tuberculosis, maternal health, child health, public health nursing, and sanitary engineering, and also clinical doctors and nurses. Since then, most of these refugees have been repatriated. Each returning group was accompanied to its destination by an UNRRA repatriation team, including a doctor and two nurses. There now remains only one of these camps, at El Shatt, with a few hundred refugees.

A problem of greater magnitude was presented by the displaced persons under UNRRA care in Germany, Austria, and Italy. At the end of May, 1946, there were 826,580 such persons in assembly centers in the three countries. The Health Division was responsible for recruiting the necessary health personnel and giving technical supervision. An extensive immunization program was undertaken. In most of the assembly centers a large part of the medical, dental, and nursing services was provided by professional persons found among the displaced persons, with overall supervision by UNRRA staff. Dispensaries have been set up and arrangements made for hospital care, mostly in local institutions with UNRRA supervision. Nurses among the displaced persons are being given refresher courses, and other women are being trained as nurses' aides, in order to replace UNRRA nurses as they are withdrawn. The health conditions in the

assembly centers have been on the whole quite satisfactory.

#### INSTRUCTION OF HEALTH PERSONNEL

In the long run much more is gained by training the nationals of a country to do their own health work than by introducing relays of foreigners to do it for them. For training for participation in relief and rehabilitation work in the field of health, UNRRA brought many Fellows from the assisted countries to educational centers of the United States and of the United Kingdom and other countries of Europe, and arranged for their studies and tours of observation. The first group consisted of 12 technical experts from China who came to the United States in 1944. After their return, many of them assumed key positions, becoming, for examples, Head of the Medical Commission of CNRRA, Director of Medical Supplies of this Commission, Director of the Anti-Epidemic Prevention Bureau of the National Health Administration, Director of Hospitals and Health Centers of the NHA, and Head of the Department of Sanitary Engineering in the National Institute of Health.

In 1946 a new program of UNRRA fellowships was offered, with 44 falling to the Health Division. The recipients included physicians, nurses, sanitary engineers, radiography technicians, and students of penicillin production. They received their instruction in the United States, Canada, the United Kingdom, Sweden, and Switzerland. In 1946 there was set up also a special Nurse-Teacher Fellowship project. The Fellows were carefully chosen graduate nurses interested in teaching, 121 in number. Twenty-seven came from Italy, 20 from China, 18 from Czechoslovakia, and 19 from Poland. This group received its special training in institutions of the Department of Hospitals of New York City, with brief observation trips to other centers.

Twenty nurses from Austria and 17 from Greece were similarly trained in London.

In another of the training projects of the Health Division, medical teaching missions were sent to Poland and Czechoslovakia to visit the medical centers and bring the newer knowledge of the war years to the medical and dental professions. They had been almost completely isolated during the war years. The lecturers were provided for Poland and Czechoslovakia by a voluntary agency, the Unitarian Service Committee, with the coöperation of UNRRA. In Czechoslovakia, 14 lecturers from 8 universities began their tour in Prague and then went to Moravia and Slovakia, giving lectures and demonstrations in all 6 of the medical schools of the country. In Poland, the team of 7 lecturers included 2 dentists. It visited the principal cities, giving lectures to professional groups and students and leading discussions. Several lecturers had previously been sent to Poland by the Health Division, beginning in November, 1945, to get this valuable and much appreciated teaching started.

In 1945 a team of 11 teachers was sent to China to start a medical training program in conjunction with the National Institute of Health. The early courses in Chungking, with a total enrollment of 258 students, covered public health administration, medicine, surgery, gynecology, tuberculosis, public health and hospital nursing, maternal and child health, and bacteriology. A second series of courses was given in Peiping in the spring of 1946, with 136 students. In the interval between the two series, the teachers gave refresher courses to local medical societies and schools in Shanghai, Nanking, Peiping, and Tientsin. More recently they were assigned to medical schools in Peiping, Nanking, Chengtu, and Shanghai. Other technical personnel of the Health Division working in China have co-

operated in short courses or lectures for laboratory technicians, dentists, medical students, nurse trainees, field workers in rodent control, and medical supply officers.

The UNRRA nurse consultants in several countries, and especially in Greece, worked with the local nurse leaders in reopening and reorganizing schools of nursing and giving refresher courses in public health.

The Health Division's project in Ethiopia is essentially an attempt through teaching to take the first steps toward creating an indigenous medical and nursing profession. In this way, the ground work will be laid for a future public health service, and meanwhile the people will benefit from service of steadily rising quality. Courses for medical "dressers" and for sanitary inspectors are being conducted, and assistance is being given to the hospitals and clinics essential to this educational effort.

#### HANDING OVER TO A PERMANENT ORGANIZATION

The activities of UNRRA as here outlined are coming to an end, but many of the needs will continue and great opportunities stand open. So UNRRA has made its plans, in conference with officers of the Interim Commission of the World Health Organization, to hand over a number of its functions, on January 1, 1947, for Europe and Africa, and on April 1 for the Far East. The activities suggested for transfer to the Commission are (1) fellowships and teaching, (2) the project in Ethiopia, (3) tuberculosis, (4) malaria, (5) missions of experts to countries with special needs, and (6) the administration of these functions. To make possible the continuation of this work in the present UNRRA-assisted countries for approxi-

mately one year, after which the World Health Organization should be fully established, the Central Committee has authorized the Director General of UNRRA to turn over \$1,500,000 to the Interim Commission. No supplement of the Commission's budget will be needed when the administration of the sanitary conventions is transferred on December 1.

The temporary Health Division will soon be giving place to a permanent and growing international health organization. On relinquishing their duties, the officers of the Health Division hope that their efforts have accomplished more than the alleviation of ravages of war. The World Health Organization should make a quicker start and be able to see its way more clearly because UNRRA, at a most difficult time, attacked the problems of international health.

#### REFERENCES

1. *Journal*, Fifth Session of the Council, United Nations Relief and Rehabilitation Administration, Geneva, 5:146 (Aug. 17), 1946.
2. Selected Documents. First Session of the Council of the United Nations Relief and Rehabilitation Administration, Atlantic City, New Jersey, Nov. 10-Dec. 1, 1943, pp. 139-148. UNRRA, Washington.
3. Stowman, Knud. (Notes on Cholera) *Epidemiological Information Bulletin* (UNRRA), 1:465-469, 551-561, 2:674-678, 718-720 (July 15-Sept. 15), 1945, 1946.
4. Reimann, Hobart A., Chang, G. C. T., Chu, L.-W., Liu, P. Y., and Ying, Ou. Asiatic Cholera. Clinical Study and Experimental Therapy with Streptomycin. *Am. J. Trop. Med.*, 26:631-647 (Sept.), 1946.
5. Fan, J. H. Communicable Diseases in China during Recent Years. *Epidemiological Information Bulletin* (UNRRA), 1:495-521 (July 31), 1945.
6. Stowman, Knud. The Diphtheria Situation in Europe. *Epidemiological Information Bulletin* (UNRRA), 2:147-158 (Feb. 28), 1946.
7. Vine, J. M. UNRRA's Health Campaign in Greece. *Lancet*, 250:789-791 (May 25), 1946.
8. Daniels, Marc. Tuberculosis in Poland. *Lancet*, 251:537-540 (Oct. 12), 1946.
9. Metcalf, J., and McQueeney, A. J. Clinical Malnutrition in Italy in 1945, Nutritional Status of Selected Population Groups. *New England J. Med.*, 235:451-460 (Sept. 26), 1946.
10. Souza, G. H. de Paula. History of the International Sanitary Conventions, 1944. *Epidemiological Information Bulletin* (UNRRA), 1:5-12 (Jan. 15), 1945.

# Report of the Chairman of the Executive Board of the American Public Health Association to the Governing Council 1945-1946

THIS was the year when the membership of the Association went over the 10,000 mark. Many of my colleagues would feel, perhaps, that this is a less dramatic statement with which to open an annual report than might be made about any one of half a dozen events of an especially eventful year.

I hold, however, to the old-fashioned idea that in a democracy or in a democratic organization people are more important than happenings and that events have significance and meaning only as they are judged by their effects upon people.

Five years ago five thousand persons by the fact of their membership sanctioned what the Association is, what it stands for, and what it has done. Now as then sole compulsion to join this professional society comes from the voluntary urge of the individual to enter a community of persons with similar objectives and aspirations. But the urge is not translated into action unless it is rooted in the belief that the common cause is being advanced in a direction and by methods acceptable to the individual. Today twice 5,000 individuals sanction the Association's purposes and its program. Among them there may be healthy differences of opinion but there is no fundamental confusion. This is the perspective in which we attempt to assess what has been made to happen by the 10,000 men and women who are this organization.

Ours is a community of influence and

power. No one can scan the *Membership Directory* which has just been published, in which each of the 10,000 and more is listed and identified, without an awareness of the great strength which is there in total. The vast professional reservoir, this collective public health "know-how," cannot be matched anywhere in the world in a single organization. It is the Association's prestige. It is the Association's propulsion into a position of leadership as new vistas open before us. It is the reason it is entrusted with responsibilities which might conceivably be fulfilled under other auspices but without the authority the Association alone possesses.

These acquisitions to our joint resources and energies, which in essence is what the growth in membership over the past few years means, have had their effect in very concrete terms. The first consequence of a membership which has passed the 10,000 figure is the demand for more service from the Central Office. Simple mathematics show us that ten thousand members want more books, more *Journals*, more reprints, more information, more self-expression, more of everything on a sheer quantitative basis than 8,000 or 5,000. As a result the secretarial and stenographic force has been enlarged. A more subtle and more important consequence is that new projects have a way of being laid at the door of a going concern of proved power and effectiveness and



they require professional attention at headquarters. The expansion of professional staff has, therefore, been mandatory this year. Young, qualified persons have been selected for specific responsibilities as the Association has accepted more opportunities to be useful to public health workers, and through them, to the public.

In May an Engineering Associate was added to the administrative staff. Plans are now under way to secure an engineering field consultant. These two appointments recognize the importance of the engineer in public health programs and make his interests one of the paramount concerns of the Association at a strategic time. A medical vocational consultant on a full-time basis is in charge of the counselling and placement service. The Merit System Unit staff has been augmented by a field consultant with major experience in education and psychology. The Subcommittee on Medical Care has opened a Washington office with a technical secretary, a medical field consultant, and a research associate.

None of this strengthening of the Central Office staff could have been effected if the projects to which these new persons are attached had not commended themselves as worthy of support to foundations and other agencies. The Rockefeller Foundation has made possible the work of the Subcommittee on Medical Care. The National Foundation for Infantile Paralysis has provided the funds for the enlargement of the Merit System Unit staff, its officers realizing the value to their own objective—the elimination of poliomyelitis and the alleviation of its effects—of well trained, properly selected local and state public health personnel. It is for this reason that they have wisely provided funds for the extension of the services of the Merit System Unit to local health departments. The introduction of the engineering field consultant service has

come about by funds raised by the sanitary engineering profession itself on a matching basis with funds provided also by the National Foundation for Infantile Paralysis.

In a report in which expansion is the keynote, it is appropriate to acknowledge at the outset the generosity and confidence of these foundations and agencies for their contributions to the growing process. The Albert and Mary Lasker Foundation has provided funds for the Lasker Awards and their administration. We include in our appreciation others whose continued financial coöperation, in many instances over a long period of years, has sustained enterprises which have become part of the Association's permanent program. The patriarch among these is The Commonwealth Fund with its support of state studies for the Committee on Administrative Practice, and its continuation for the second year of support for the Accreditation project of the Committee on Professional Education. The U. S. Public Health Service and the Children's Bureau still stand behind the Merit System Unit. The former has provided the means through which the Association has been able to purchase expensive duplicating equipment, thus making the Unit's services more effective. It has also continued its support of the Vocational Counselling and Placement Service, now an important arm, organizationally, of the Merit System Unit with the vocational director serving both projects.

The W. K. Kellogg Foundation made available this year \$15,000 for the first National Conference on Local Health Units held at Ann Arbor under the sponsorship of the Association through its Committee on Administrative Practice, the University of Michigan, and the Association of State and Territorial Health Officers. The W. K. Kellogg Foundation, too, financed a meeting of the Study Group on Sanitation, looking

toward the development of an evaluation schedule on environmental sanitation for general use by health units. To the Milbank Memorial Fund and the National Tuberculosis Association we owe acknowledgment for funds given to the Subcommittee on the Hygiene of Housing; to the American Drug Manufacturers Association for moneys which promote activities of the Subcommittee on Evaluation of Administrative Practices, and to our Sustaining Members whose names we have featured in the new Membership Directory.

Ear-marked funds for special purposes plus the income from dues of 1,620 Fellows, 8,752 members, 36 Sustaining members, 26 affiliated societies, subscription fees from another 3,000 non-member *Journal* readers, the Association's business services such as advertising and exhibit space, books, and pamphlets have given us sufficient income for the adequate discharge of our old and new commitments. We are operating on an assured budget of approximately \$275,000, keeping our expenditures within it even in a year when anticipations of expenditures must be revised upward almost daily.

In acknowledging our appreciation for the substantial funds put at our disposal this year, I have named a number of the activities in which the Association has been engaged in 1946. The full record, embracing both old and new, is so diverse and comprehensive that all a report like this can hope to do, and remain within reasonable limits, is to summarize, interpret occasionally, and synthesize. In a field as broad as ours, where concern with every phase of public health is exercised by one or another of our nearly 200 organized groups, what is the process of selection and what the criterion of emphasis for the chronicler of the year's events?

Matters enter the blood stream of the Association through several avenues. One is via the Sections. Section ac-

tivity is revealed through the Annual Meeting program, through published reports, papers, and books. A new volume coming from the Laboratory Section which will soon be exerting wide influence is the Ninth Edition of *Standard Methods for the Examination of Water and Sewage*, published in cooperation with the American Water Works Association. It is on the press and will be available this year. We credit Dr. John F. Norton's patience, skill, and ability for its completion. The Section expects to take action during the Annual Meeting upon the text for the Ninth Edition of *Standard Methods for Dairy Products*, representing a thorough revision of the earlier edition through the monumental efforts of Dr. Robert S. Breed and Dr. A. H. Robertson. After following the routines prescribed by the By-Laws for all standards to be issued in the name of the Association, the manuscript will be released to the Central Office for publication. The book will issue in 1947. In the discussion stage, and to be advanced by a session on the subject at the Annual Meeting, is a companion volume to *Diagnostic Procedures and Reagents*, on virus and rickettsial diseases.

The Dental Health Section is in sight of the goal toward which it has labored for two years—delivery of a set of manuscripts by some 18 qualified authors on the history, present status, and future of public health dentistry. The year's end will see the book completed. The Maternal and Child Health and School Health Sections have been exploring with their physician members the attitude toward the establishment of a qualification and examination by the American Board of Pediatrics, for pediatricians in public health. The Public Health Education Section has adopted regionalism as its keynote and is attempting to work out health education problems within the framework of

this philosophy. The Annual Meeting program, developed without wartime restrictions and accordingly more extensive than at any time in four years, and the contents of the *Journal* for the next several months will indicate other Section interests and accomplishments.

The Standing Committees initiate and carry on many of the activities in which we and they may well take pride. They have their own able spokesmen and their Chairmen will present detailed reports to the Governing Council for the first time in two years. I intend only to index for the record the important concerns of the Standing Committees, leaving it to their respective leaders to develop my chapter headings:

The Committee on Administrative Practice, Wilton L. Halverson, M.D., *Chairman*:

- Studies of state and local health administration
- The promotion of the evaluation process
- Health Practice Indices
- The Subcommittee on Medical Care
- The first National Conference on Local Health Units
- The evaluation of administrative practices
- Accident prevention
- Reciprocal sanitary milk control

The Committee on Professional Education, William P. Shepard, M.D., *Chairman*:

- The accreditation of schools of public health
- The Merit System Unit
- The Vocational Counselling and Placement Service
- Salaries of public health workers
- Educational qualifications of public health workers
- A specialty board in public health

The Committee on Research and Standards, Kenneth F. Maxcy, M.D., *Chairman*:

- The Standard Methods Committees
- The Committee on Hygiene of Housing
- Control of Communicable Diseases
- Control of Air-borne Diseases

The Committee on Eligibility, Vlado A. Getting, M.D., *Chairman*:

- Membership
- Fellowship
- Life Members
- Affiliated Societies
- Honorary Fellows

This is a calling of the roll of highly significant enterprises of which you will hear more from the Chairmen themselves.

Other of our activities have no structural or functional tie to any Section or any Standing Committee but cut across all organizational lines. There is, of course, the *Journal*. It has continued its series of special review articles started in 1945. In the 11 issues beginning with January, 1946, seven of these review articles have appeared. Three of them have dealt with relatively new scientific developments, Blood and Blood Derivatives, the Rh Factor, and the Position of DDT as an Insecticide; another summarized the school health services under governmental supervision in England and Wales. The *Journal* has kept its readers informed of the main developments in the World Health Organization. The November issue prints the W.H.O. Constitution in full and will carry the major address at the opening General Session of the Cleveland Annual Meeting by Dr. Parran and Dr. Boudreau which discusses the platform and purpose of the World Health Organization. Although the paper shortage still inhibits the *Journal* editors, each issue in 1946 has averaged twelve pages more than in 1945. The total circulation of the *Journal* remains at about 13,000, the cancellation of several hundred army subscriptions having been very largely made up by the increase in membership.

The authority and influence of the editorials by Professor C.-E. A. Winslow, the *Journal's* Editor, have been manifest in many ways. Requests have been widespread for permission to reprint *Panic or Reason in Dealing with Poliomyelitis?* in the August issue. Likewise, a Challenge to the Voluntary

Health Agency of October, 1945, continues to be widely read and discussed. The Association is indeed fortunate that in his retirement from the Yale Department of Public Health, Professor Winslow gives so freely of his talents of mind and pen to the *Journal* and the Association.

Made necessary by the increasing costs of publication, and amply justified by its increase in circulation, advertising rates in the *Journal* are about to be increased for the first time in 20 years. The *Journal's* circulation has increased by more than one-third in the past five years.

The work of the Committee on Constitution and By-laws, Dr. Edward S. Godfrey, Jr., *Chairman*, affects the entire Association in that it provides a sound basis upon which to build our organization. The committee, after two years of thoughtful study and examination, and with the approval of the Governing Council, is presenting at the Annual Meeting a revised Constitution and By-Laws. The document was published in the September *Journal* and the Fellows will vote upon the proposed amendments to the Constitution, and the Governing Council upon the proposed amendments to the By-laws. If they are accepted, we and individuals yet to share in the privileges and responsibilities of Association membership will be deeply in the debt of Dr. Godfrey and his committee members for a masterly recodification and clarification of a Constitution and By-laws which had become difficult of application and obscure as it was added to over the years in continuing attempts to democratize our procedures.

Other committees, like the Committee on Constitution and By-laws, are created by the Governing Council or the Executive Board for temporary or continuing purposes. A committee under the Chairmanship of Dr. George Baehr and including such outstanding

scientists and administrators as Thomas Francis, M.D., Hugh R. Leavell, M.D., Robert F. Loeb, M.D., Karl F. Meyer, Ph.D., Thomas Parran, M.D., Alfred N. Richards, M.D., James S. Simmons, M.D., and Ernest L. Stebbins, M.D., was appointed to determine the persons and organizations who should be honored for scientific and administrative achievement by the bestowal of the Lasker Awards.

From a long list of candidates, many of whom were proposed by the Fellows of the Association, the following individuals have been selected and for the reason mentioned to receive a cash award of \$1,000 and a statuette suitably inscribed:

- Dr. Carl Ferdinand Cori—For research in the rôle of anterior pituitary, insulin and hexokinase in carbohydrate metabolism
- Dr. Karl Landsteiner (posthumously), Dr. Alexander S. Wiener and Dr. Philip Levine—For research in the Rh factor
- Dr. John F. Mahoney—For research in the penicillin treatment of syphilis
- Dr. Alfred Newton Richards—For organization and administration of the Committee on Medical Research of the Office of Scientific Research and Development
- Dr. Fred L. Soper—For organization of eradication campaigns against yellow fever and malaria

The following groups have been cited for the reasons mentioned, the leader to receive on behalf of the group a statuette suitably inscribed:

- The Army Epidemiological Board—For distinguished service in the control of infectious diseases, bringing a permanent enrichment to medical science
- The Board for the Coordination of Malarial Studies—For accomplishments leading to a rational approach to the eventual solution of the malaria problem
- The Bureau of Entomology and Plant Quarantine—In recognition of distinguished service in the solution of problems involving the health and comfort of the Armed Forces, with particular reference to insect-borne diseases
- The National Institute of Health—In recognition of its fundamental contributions to the prevention and control of disease

The Northern Regional Research Laboratory—  
For studies leading to the mass production  
of penicillin

These Awards presented for the first time at the Cleveland Annual Meeting represent an expansion of the Association into a larger world. Public health is only just beginning to take note of the fact that future gains in national health and well-being must come in a new area, with a new group of persons, and with new techniques not yet crystallized. With infectious diseases of childhood and tuberculosis largely conquered, the new concern of public health is with the adult population—not only keeping it alive but, far more important, keeping its life active, socially useful, and personally rewarding. This is the significance of the Lasker Awards. The Association is indeed fortunate that the high purpose of its activities has inspired the Albert and Mary Lasker Foundation to make it the vehicle for a series of awards "to recognize achievement and to stimulate medical research, with special reference to those diseases which are the major causes of death."

Little that happens in the nation or in the world today concerned with public health escapes the Association's influence in one way or another. In the most important development of the year—the beginnings of the World Health Organization—two of the Association's Fellows represented the United States at the Technical Preparatory Commission in Paris in March. Eighteen Fellows and 22 Members were among the delegates, representatives, and advisers to the International Health Conference in New York, June 19 to July 23.

Dr. Thomas Parran was unanimously elected to serve as President of the Conference. The Conference adopted a constitution and provided for an Interim Health Commission until the

World Health Organization should be fully organized.

The breadth of the Association's interests and the depth of its influence are a poignant reminder of the giants we have lost during the year—Mazzyck P. Ravenel, Milton J. Rosenau, and Waller S. Leathers. These three long-time practitioners and pioneers of public health and charter Fellows of the Association gave immeasurable service in making not only the Association the power that it is today but also in giving public health its current prestige. Dr. Ravenel brought the *Journal* to the status of a first class professional journal; Dr. Rosenau had two careers, each worthy of a lifetime, one in Harvard and one as the founder of the North Carolina School of Public Health; Dr. Leathers made a great contribution to medical education, and was adviser extraordinary to such agencies as the American Red Cross, the Commonwealth Fund, and many others. Each was elected President of the Association, but Dr. Rosenau did not live to serve his term. The war and the absence of an annual meeting in 1945 delayed by a year his elevation to the Presidency, to the great loss of the Association. Although there will be recognition of the passing of these three men in formal resolutions, I believe it fitting that our irreparable loss be recorded here as well.

We have said that happenings are significant only as they affect people. We do not always know how the things we are doing are influencing others, but not infrequently we have direct evidence of the impact practically of what we do academically. The *Evaluation Schedule* of the Committee on Administrative Practice, Dr. Halverson will tell you, is finding a wider acceptance and usefulness. Let me dramatize for you what this means with an illustration or two. Out in Kansas, where I'm told it's hard to get people to drink milk

and even harder to get it pasteurized, the Chamber of Commerce of a certain community became interested in the performance of its health department. A committee studied the *Evaluation Schedule* and found that the pasteurization of only 50 per cent of the community's milk supply brought it far down on the index scale for that activity. There resulted a community demand for a more extensive pasteurization program, a development the local health officer had attempted unsuccessfully through various other approaches.

Or consider a western city whose population more than quadrupled during the war production years, whose Negro population increased from two or three hundred to 15,000, and whose health department consequently found itself under the necessity of organizing to meet its expanded problems. An imaginative health educator used the *Evaluation Schedule* to teach the community about the self-evaluating process. Based on the *Schedule*, community committees set up an analysis of the health needs and resources out of which its present dynamic health program grew.

Another item that will be more fully discussed has to do with the extent to which the study and the basic principles of the Subcommittee on Local Health Units are affecting the philosophy and development of public health service. The framers of federal legislation have used its findings no less than the State Board of Health of Montana whose planning encompasses only about half a million persons. Such diverse national magazines as *Hygeia*, *The Survey*, and *Public Administration Review* have found this program germane to their separate interests.

Another example of the continuing services your Association renders to a wide and varied public may be found in the work of the Subcommittee on the Hygiene of Housing. There is wide-

spread and growing recognition of its housing appraisal method as a practical means for evaluation of substandard housing conditions and as a sound basis for shaping remedial programs. Substantial surveys by this method have been carried out in a number of cities of the United States, as Dr. Maxcy will report, but its influence does not end at our borders. Housing in Panama is being surveyed on the basis of the appraisal method. The survey, together with a summary of the appraisal methods, is being published in Spanish for distribution in Latin America at the instance of the Association in coöperation with Science Service.

Finally, for the sake of the future historian who will wonder how the Association took care of its elections and other legalities prescribed by its Constitution and By-laws in a year without an Annual Meeting—as 1945 was—and for which we had no precedent, it should be recorded here that the Executive Board invoked Article IV of the Constitution which provides that “all officers shall serve until their successors are elected and qualified.” This action held in office all elected and appointed persons whose terms would otherwise have expired in 1945. On the recommendation of the Committee on Constitution and By-laws, made after obtaining legal counsel, all offices which would have been vacated ordinarily in 1945 are vacated this year, making it necessary for the Fellows present and voting at the Cleveland Annual Meeting to elect 20 instead of 10 members of the Governing Council, 10 with terms expiring in 1948 and 10 with terms expiring in 1949. Under this decision there are 4 instead of 2 vacancies on the Executive Board to be filled. The Section Councils, the Committee on Eligibility, and terms of members of Standing Committees are similarly affected. This is a year in which twice the usual number of elections and ap-

pointments must be made. Both a President and a President-elect must be elected this year. Other responsibilities which must be carried out during the Annual Meeting bulk larger than in any previous year. The Committee on Eligibility will report on 216 applications for Fellowship—nearly 100 more than ever before—and 79 applications for Life Membership. Again the added responsibilities of the Central Office must be referred to—in connection with Fellowship applications more than 600 individual pieces of correspondence are in the files representing replies from references, and this checking of credentials is only a small part of the process.

To complete the story for the historian, let us say that for the first time we are using a voting machine for the election of members to the Governing Council instead of the familiar written ballots.

The future of our community is replete with immediate possibilities for usefulness. Our problem as an Association is no longer money, as it once was, but personnel and space. We have arrived at the stage where selection is the important thing—selection from among many things offered us for sponsorship. There are at least two large projects in new fields awaiting our decision at this moment, and there will be more before the year's end. In its 75th year, it may be said that the Association has just begun to roll and so have the public health professions which we represent. And as always it must be emphasized that "prime movers" are required to operate any machinery. Not the least of these are the Executive Secretary and his staff, to whom the entire membership owes a continuing debt for enthusiasm, intelligence, and efficiency.

ABEL WOLMAN, DR.ENG.

# Public Health Degrees and Certificates Granted in the United States and Canada During the Academic Year, 1945-1946\*

THE Committee on Professional Education presents its annual report of Public Health Degrees and Certificates Granted in the Academic Year, 1945-1946. In the current report all tabular data except two 5 year summaries are omitted. This is purely experimental to determine the demand for the material. Tables such as those published in previous years have been prepared and are available in mimeograph form on request from the offices of the Association. If the demand for them warrants it, they will again be published in the *Journal* in future years. There will be no lack of continuity in the data available for comparative purposes.

As formerly, the present report is based on returns from a questionnaire sent to the administrative officers of the schools offering graduate degrees. Their replies have been subjected only to statistical review. Only graduate students enrolled in courses leading to graduate degrees or certificates are included in the tabulation. Exceptions are public health nursing students, among whom are included those receiving Baccalaureate degrees or certificates in public health nursing. For figures on public health nursing students and degrees, the committee is indebted to the National Organization for Public Health Nursing, which has permitted their use in this report.

The report is based on 27 schools giving either or both public health and public health engineering degrees and 32 of 34 schools giving approved courses in public health nursing.

The first significant fact suggested by the reports of the academic year just passed is the continuing increase in both enrollments and degrees granted. The percentage increase is most marked among public health engineering, and least among public health nursing students. Enrollment of public health and public health engineering students together increased by more than a third over the previous year, a little less than one-third for the former, more than one-half for the latter. Since the low of 1942-1943 there has been an increase of nearly 90 per cent in enrollments (Table 1). Enrollment in graduate public health nursing courses is not reported.

The number of all students receiving degrees has increased by more than one-fifth since last year, nearly one-third for public health, two-thirds for public health engineering, and less than one-fifth for public health nursing students. Since the low point, both public health and public health engineering degrees have more than doubled. Public health nursing degrees on the other hand increased only one-third since the low point in 1941-1942, which was a

\* For previous reports see *A.J.P.H.*, Vol. 35, p. 1311; Vol. 34, p. 1264; Vol. 33, p. 1430; Vol. 32, p. 1360; Vol. 31, p. 1306; Vol. 30, p. 1456; Vol. 29, p. 1338; Vol. 28, p. 863; Vol. 27, p. 1267; Vol. 26, p. 819; Vol. 25, p. 341; Vol. 23, p. 1124.



TABLE 1—ENROLLMENT IN GRADUATE PUBLIC HEALTH COURSES AND STUDENTS RECEIVING GRADUATE DEGREES OR CERTIFICATES, FIVE YEAR SUMMARY, 1941-1946

Academic Year	Enrollment			Students Receiving Degree or Certificates			
	Total	Public Health	Public Health Engineering	Total	Public Health	Public Health Engineering	Public Health Nursing
Total	2,746	2,254	492	5,925	1,258	249	4,418
1941-1942	629	466	163	1,077	269	89	719
1942-1943	387	323	64	1,057	159	24	874
1943-1944	460	396	64	1,119	207	35	877
1944-1945	540	462	78	1,204	270	38	896
1945-1946	730	607	123	1,468	353	63	1,052

year earlier than the low point for the other two groups.

It may be concluded, therefore, that the arrears in training piled up during the war years are beginning to be made up. In each group except engineering more degrees were granted in 1945-1946, than in any of the last six years.

As in previous years the professional background of the graduate students enrolled in public health courses was

reported. Physicians numbered 244, or two-fifths of the total, public health educators, 176, or less than 30 per cent. Each group is a larger percentage of the total than in the previous year.

The number of Master of Public Health degrees granted increased by more than one-half, due perhaps to the accreditation program which advises discontinuing the use of the M.S.P.H. degree. The number receiving the

TABLE 2—STUDENTS RECEIVING GRADUATE DEGREES OR CERTIFICATES—SUMMARY, 5 YEAR PERIOD, 1942-1946

Degree or Certificate	Total	1941-42	1942-43	1943-44	1944-45	1945-46
Total	5,925	1,077	1,057	1,119	1,204	1,468
Doctor of Public Health	40	12	7	10	8	3
Doctor of Engineering	5	2	1	2	..	..
Doctor of Science	24	17	1	3	..	3
Doctor of Philosophy	22	9	2	3	4	4
Master of Public Health	691	151	83	101	140	216
Master of Civil Engineering	16	6	3	5	1	1
Master of Science	118	28	13	29	17	31
Master of Science, Public Health	261	73	19	45	68	56
Master of Science, Public Health Engineering	11	2	1	4	..	4
Master of Science, Sanitary Engineering	23	4	2	1	..	16
Master of Science, Civil Engineering	4	2	..	..	1	1
Master of Arts	7	1	..	3	3	..
Master of Arts in Science	7	3	1	..	..	3
Master of Sanitary Science	36	..	..	..	18	18
Master's Degree (Nurses)	276	22	43	43	32	136
Diploma, Public Health	113	19	20	18	22	34
Diploma, Veterinary Public Health	10	..	..	..	6	4
Baccalaureate Degree (Nurses)	1,785	215	388	361	302	429
Certificate, Public Health	29	4	14	5	2	4
Certificate, Medical Technology	52	..	14	12	14	12
Certificate, Public Health Nursing	2,355	482	443	472	472	486
Other	40	25 <sup>a</sup>	2 <sup>b</sup>	2 <sup>c</sup>	4 <sup>d</sup>	7 <sup>e</sup>

<sup>a</sup> Includes 24 certificates in Engineering Science and Management Defense Training and one Master of Science in Engineering

<sup>b</sup> Includes two Civil Engineers

<sup>c</sup> Includes one each of Doctor of Public Health Nursing and Master of Science in Preventive Medicine and Public Health

<sup>d</sup> Includes one each of Master of Science in Hygiene and Diploma of Industrial Hygiene and two Diplomas in Dental Public Health

<sup>e</sup> Includes one Doctor of Public Health in Nursing, two each of Master of Science in Hygiene and one each of Sanitary Engineer and Diploma in Industrial Health

latter degree decreased nearly one-fifth and was important in only one school. A further noteworthy development is indicated by the fact that the number receiving Masters degrees in Public Health Nursing was three times as large as in any previous year, while the number receiving the Baccalaureate degree or Certificate in Public Health Nursing increased only slightly (Table 2).

A word about the number of schools offering graduate public health or public health engineering courses. Twenty-

seven schools reported offering such degrees. Of these, 3 had no students registered, 8 had fewer than 5 students, and 14 fewer than 10 students. Thus 669 of the 730 enrolled students were provided for in 10 schools. Of the 416 students receiving degrees in 20 schools, 381 were in 9 schools giving degrees to from 13 to 114 students. The remaining 35 degrees were granted by 11 schools. Among the nursing schools only two granted degrees to fewer than 10 students.

WILLIAM P. SHEPARD, M.D., *Chairman*

# American Journal of Public Health

## and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 37

January, 1947

Number 1

### Editorial Board

REGINALD M. ATWATER, M.D.

*Chairman, and Managing Editor*

IRA V. HISCOCK, Sc.D.

KENNETH F. MAXCY, M.D.

RALPH S. MUCKENFUSS, M.D.

ALTON S. POPE, M.D.

C.-E. A. WINSLOW, Dr.P.H.

C.-E. A. WINSLOW, Dr.P.H., *Editor*

AUGUSTA JAY, *Editorial Associate*

## THE CLEVELAND MEETING

THE seventy-fourth Annual Meeting of the American Public Health Association at Cleveland (November 12-14) was one of the most successful in its history. The registration of over thirty-three hundred was the largest recorded for any regular annual meeting held outside New York City. The first General Session was the occasion of an important address by Dr. F. G. Boudreau on the World Health Organization; of the new Lasker awards (discussed in the December issue of this *Journal*); and of the award of the Sedgwick Memorial Medal "For Distinguished Service in Public Health" to Dr. Karl F. Meyer of San Francisco. The highlight of the Banquet was the announcement of the approval of the amended Constitution and of the choice of Professor Harry S. Mustard as President for 1946-1947 and of Dr. Martha M. Eliot as President-elect for 1947-1948. Dr. Mustard's outstanding leadership as an expert in public health administration and as Director of the School of Public Health at Columbia makes him a fitting link in the long chain which carries us back to the days of Stephen Smith; and the selection of Dr. Eliot (the first woman to hold this high office) is an appropriate tribute, not only to a courageous and statesmanlike personality but to the constructive impetus which the U. S. Children's Bureau has given to the cause of public health.

The program of the conference was enriched by a wealth of important technical papers which will be presented in the columns of this *Journal* during succeeding months. Methods for the isolation of the gonococcus, and for the laboratory study of virus diseases, procedures for the disinfection of air, the neutralization of poliomyelitis virus by the serum of patients and contacts, the relation (or lack of relation) between infectious hepatitis and homologous serum jaundice, the importance of the Rh factor, the values of BCG, the sterilization of eating utensils, and the importance of a regional approach in health education were among the specific subjects discussed. Lloyd Florio reported important results on the etiology of Colorado tick fever. Striking data were presented on the effects of acute nutritional deficiency. Many valuable contributions were made in public health engineering, vital statistics, and industrial hygiene. Our youngest Section, dealing with dental health, had an extensive and effective program.

Sessions of the Health Officers Section were particularly stimulating. This group came to grips with such vital administrative problems as the methods of allotting state and federal funds to local units and the program audit, a new device for guiding wisely the expenditure of such funds. Discussion from the floor was active and constructive; and, as at other recent annual meetings, the participation of increasing numbers of keen young health officers was a most heartening phenomenon. W. P. Shepard and R. M. Atwater, however, sounded a note of warning for the future in a paper on "The Key to Better Public Health Service," said key being the establishment of more adequate salary scales in state and local health departments.

The interest of the profession in the newer challenges to the health officer of the future was registered in special sessions devoted to Medical Care, to Housing, and to Problems of an Aging Population. In all these areas we are passing from academic discussions of what ought to be done to scientific analysis of what is being done. In medical service to the indigent, the Maryland State Health Department plan is a going concern; and the symposium on housing brought convincing evidence of the value of the A.P.H.A. procedure for evaluation of sub-standard housing as applied on a large scale in Los Angeles and Milwaukee.

In some ways the most impressive session of all was a Special Session, on the last day, devoted to the actual service projects now being carried forward by the Association itself through its standing committees and staff. Few of our younger members have realized the full extent of such activities. At Cleveland, they learned how the Committee on Eligibility (under Vlado Getting) safeguards the professional standing of the Fellowship of the Association. They heard of the remarkable achievements of the Committee on Administrative Practice (under W. L. Halverson); and, particularly, of the reports of Subcommittees (both led by Haven Emerson) on Local Health Units and on Communicable Diseases. The Health Unit Program is making notable progress throughout the country, seventeen new local full-time health jurisdictions having recently been authorized in one election in the State of Illinois; and the report on the *Control of Communicable Diseases* has been translated throughout the world and formally adopted as standard in many countries. The Committee on Research and Standards (K. F. Maxcy, Chairman), through the Laboratory Section, has completed a new edition of *Standard Methods for the Examination of Water and Sewage* and will shortly have ready a new edition of *Standard Methods for Dairy Products*. Its Subcommittee on the Hygiene of Housing hopes to complete in 1947 a four volume manual on the essential features of sound and healthful housing. The Committee on Professional Education (W. P. Shepard, Chairman) is continuing its invaluable formulations of qualifications for various types of public health personnel, and has established a continuing program of accreditation for schools of public health. The Merit System Unit has had phenomenal success in developing sound procedures for the grading of applicants for various positions in public health, now already in use in half the states of the Union.

In all these activities the staff of the Association, which has been greatly strengthened in recent years, is playing a constructive and ever-increasing part.

All in all, no one could attend the meetings in Cleveland without a growing pride in being a part of an organization which is so fully and effectively fulfilling its responsibilities as the official representative of the profession which has the health of the American people in its charge.

## PUBLIC HEALTH AS SEEN BY ENGLISH EYES

ON the way back from Cleveland the editor was interested to look over the proceedings of the Health Congress at Blackpool, held under the auspices of the Royal Sanitary Institute last June. The convention techniques of Great Britain and the United States are widely different. The Cleveland program scheduled over 220 papers and symposia for a period of three days; the Blackpool program, about 35 papers in five days. We encourage a wide range of communications which present the details of new scientific papers and provide a wonderful opportunity for the younger men to try their wings. The British plan presents only a few addresses by outstanding leaders and allows ample leisure for tea and excursions and leisurely social contact. Each type of procedure is an expression of national psychology.

Even more interesting, perhaps, is the difference in fields of interest illustrated by the two conventions. At Cleveland the overwhelming mass of contributions dealt with technical problems in the established fields of laboratory procedure, epidemiology, sanitation, vital statistics, health education, maternal and child health, school health, and industrial hygiene. At Blackpool, only 12 addresses fell within this field, about 37 per cent of all papers presented, as compared with 86 per cent of all papers presented at Cleveland. Problems primarily of interest from the standpoint of public health administration occupied 8 per cent of the American, and 15 per cent of the British program. Nutrition accounted for 5 per cent of the American and 9 per cent of the British papers; hospitalization and medical care for 2 per cent of the American and 6 per cent of the British program; housing and heating and ventilation for half of one per cent of the American and 21 per cent of the British program. The Cleveland convention had 7 papers on dental hygiene, the Blackpool program none; the Blackpool meeting had 3 papers on veterinary medicine, and 1 on traffic control, the Cleveland meeting, none.

Perhaps such an analysis may seem trifling. It certainly will not bear the weight of a statistician's analysis of probable error.

It does, however, suggest two thoughts to the writer. The first of these reactions is a deep pride in the great mass of solid and significant scientific research which is coming from the health services and the universities of North America to form the sure basis for our technical progress in the future. The second question raised is whether we do not need to add to our encouraging process in the basic microbiological, epidemiological, statistical, and engineering foundations of public health a wider vision of its social applications in the future. The organization of the nursery school; the rehabilitation of problem families; aspects of heat, light, and sound in relation to town planning; the care of the aged in health and sickness; roads and traffic problems; housing and slum clearance; and even "Form and Color in Landscape" were among the subjects discussed by our English brethren. It seems probable that our Association in future years may devote a larger proportion of its time to such problems, in regard to which the expert on physiological and psychological health has a vital contribution to make.

THE IMPORTANCE OF CONTROLS IN PUBLIC HEALTH  
FIELD STUDIES

NO competent investigator conducts experiments in the laboratory without providing for adequate controls, since the very essence of experimental

research involves the elimination of all but a single variable in the complex chain of biological processes. In statistical research the same end can often be attained by application of the techniques of multiple correlation. In field studies made with regard to the value of an immunization procedure, or the importance of a particular dietary factor, or the influence of an air-conditioning process, the setting-up of effective controls is more difficult and the lack of such controls invalidates many time-consuming studies. The demonstration of the value of influenza vaccine by Army investigators is an example of a study in which proper controls were used.<sup>1</sup> A recent report on the influence of vitamin supplementation on nutritional status of aircraft workers in California<sup>2</sup> is another excellent example of sound scientific method.

This investigation covered about 500 young male subjects and lasted for about one year. All the volunteers who took part were given a very thorough physical examination—with special emphasis on the delicate modern tests for vitamin deficiency—at the beginning and at the end of the observation period. During this period each subject was given tablets and capsules on five days of each week; but these tablets in the case of one-half the subjects (supplemented group) contained suitable amounts of calcium and of six vitamins; while the other half (placebo control group) received only inert placebos. A third group of workers who received no medication were used as a normal control group. All three groups were closely comparable as regards age, duration of employment, and type of work. No case of severe nutritional deficiency was present in any group but a majority of the subjects had evidence of chronic, mild nutritional deficiency by various special criteria which have been suggested as significant.

Most of the tests thus far advanced for the detection of mild symptoms of dietary deficiency showed no significant difference between the experimental and placebo groups. This was true of abnormalities in reflexes, calf muscle tenderness, plantar dysesthesia, loss of vibratory sensibility to a C-256 tuning fork, thresholds of vibratory sensibility and paresthesias as test of thiamin deficiency; of cheilosis, angular stomatitis, sebaceous plugs, seborrheic dermatitis and corneal vascularization observed with the biomicroscope; and for hematological effects of vitamin mineral deficiency.

Of all the clinical tests employed only three yielded significant differences. Conjunctival opacity as observed with the biomicroscope showed a small but significantly better rating for the experimental group which had received vitamin A; there was a significantly lower prevalence of dryness of hair and a lower prevalence and less extensive follicular hyperkeratosis in the experimental group (due again to higher level of vitamin A); and there was lower incidence of mild degrees of abnormal thickness, abnormal color, and hypertrophied papillae of the tongue (due to supply of vitamin B complex).

The actual incidence of colds was essentially the same for all three groups, although both the experimental and placebo subjects *reported* that they had had fewer colds than in years before, while the normal controls did not. Both experimental and placebo groups reported that their appetites had been improved. In the placebo group, about 70 per cent reported improvement in one or more symptoms which they attributed to the "pills" they had been taking. "It was concluded that this difference in subjective impression between the two experimental groups on the one hand and the control group on the other was a psychotherapeutic effect of participation in the experiment." A larger number of the

placebo than of the vitamin group reported benefits with respect to eye symptoms, weight gain, and miscellaneous conditions. A larger number of the vitamin group reported benefits in colds, appetite, feeling of well-being, less nervousness, less headaches, less constipation, and improved digestion. Only in the case of nervousness was even the difference in subjective opinion statistically significant (7.4 per cent for vitamin group, 1.3 per cent for the placebo group).

These studies should be of material value to the student of nutrition in indicating which tests of nutritional deficiency are really promising. It is clear that with regard to most of the criteria studied, either the tests fail to distinguish between good and bad nutrition or the nutrition of the average warcraft worker in California is adequate. (Some of these tests might, of course, be of value in the study of less well nourished populations.)

The investigation is significant to all of us as a model of the type of thorough and well controlled experiments which can be carried on in many other fields of public health.

#### REFERENCES

1. *A.J.P.H.*, 36:1045 (Sept.), 1946.
2. Borsook, H., Dubnoff, J. W., Keighley, G., and Wiehl, D. G. *Milbank Memorial Fund Quarterly*, 24:99 (April), 1946.

# CONSTITUTION AND BY-LAWS

As Adopted at the Seventy-Fourth Annual Meeting, November 13, 1946

## ARTICLE I NAME

The name of this Association, incorporated under the laws of Massachusetts, is the American Public Health Association.

## ARTICLE II OBJECT

The object of this Association is to protect and promote public and personal health.

## ARTICLE III MEMBERSHIP

*Section 1.* There shall be seven classes of constituents to be designated as Fellows, Honorary Fellows, Members, Sustaining Members, Life Members, Affiliated Societies, and Regional Branches.

*Section 2.* The right to hold office, except the office of Vice-President, or to serve as a member of the Governing Council, the Executive Board, or of a Section Council, or of a standing committee, or as the chairman of a committee of the Association or of a Section, or to vote for elective Councilors or on any amendment to the Constitution shall be limited to Fellows and to Life Members and Honorary Fellows who have been elected Fellows of the Association.

*Section 3.* The qualifications of the several classes of constituents, and the dues of each of them, the manner of their election, and their rights and privileges, except as specified in this Constitution, shall be established in the By-Laws.

## ARTICLE IV GOVERNING COUNCIL COMPOSITION

*Section 1.* There shall be a Governing Council which shall consist of:

(a) The officers of the Association and the elective members of the Executive Board.

(b) The Chairman, Vice-Chairman, and Secretary of each Section, and the elective members of the Council of the Health Officers Section.

(c) One representative to be designated by each Affiliated Society.

(d) One representative to be designated by each Regional Branch.

(e) Thirty members of the Council, to be elected by the Fellowship of the Association, for three-year terms, one-third of whose terms shall expire each year. Such members of the Council shall be known as elective Councilors and shall be nominated and elected as provided for in the By-Laws. If an elective

Councilor is elected a Section Chairman, Vice-Chairman, or Secretary, or an elective member of the Council of the Health Officers Section, or appointed the representative of an Affiliated Society, or of a Regional Branch, a Councilor to fill such vacancy shall be elected by the Governing Council. All vacancies while in office shall be filled by election for the unexpired term. After two consecutive terms, an elective Councilor shall be ineligible for reelection to the Council during one Association year.

*Section 2.* The terms of all Councilors, except the representatives of Affiliated Societies and Regional Branches, shall begin at the end of the annual meeting at which they are elected, and shall terminate at the end of the annual meeting at which their respective terms expire; provided that newly elected Councilors shall have the right to attend meetings of the Council in an advisory capacity as soon as elected.

The terms of the representatives of Affiliated Societies and Regional Branches shall begin and terminate in accordance with the constitutions and by-laws of their respective organizations.

*Section 3.* The Officers of the Association shall be the Officers of the Council.

*Section 4.* A Quorum of the Council shall consist of twenty Councilors.

*Section 5.* Meetings of the Council shall be called by the Executive Secretary at the request of the President, or at the request in writing of any twelve Councilors. In the latter case, the call to the meeting shall be issued at least twenty days in advance of the meeting and shall state the purpose for which it is called.

## ARTICLE V GOVERNING COUNCIL FUNCTIONS

The functions of the Governing Council shall be:

*Section 1.* To establish and amend the By-Laws of the Association.

*Section 2.* To establish policies for the Association and for the guidance of the Executive Board and the Officers.

*Section 3.* To consider all resolutions proposed for approval in the name of the Association, and to receive and act upon a report from a committee on resolutions appointed annually by the President.

*Section 4.* To approve all standards



promulgated in the name of the Association.

*Section 5.* To receive at its first session at the time and place of the annual meeting of the Association, a report from the Chairman of the Executive Board in which the work, the accomplishments, and the financial status of the Association during the year preceding such annual meeting shall be reviewed and a statement made of the major activities contemplated for the ensuing year.

*Section 6.* To establish Sections of the Association; to combine or discontinue them when necessary; to prescribe the qualifications of the members of Section Councils and the chairmen of section committees; to maintain coördination among Sections; and to formulate general rules governing their policies.

*Section 7.* To elect the Executive Board, the officers of the Association, with the exception of the Chairman of the Executive Board and the Executive Secretary, to elect Fellows, Honorary Fellows, Life Members, and Affiliated Societies, and to establish Regional Branches.

*Section 8.* To publish after each of its meetings an abstract of the minutes of such meeting.

#### ARTICLE VI OFFICERS

The officers of this Association shall be a President, a President-elect, three Vice-Presidents, an Executive Secretary, a Treasurer, and the Chairman of the Executive Board. The officers, with the exception of the Chairman of the Executive Board and the Executive Secretary, shall be elected by written ballot of the Governing Council as provided in this article and in the By-laws. The President-elect shall serve as such from the close of the annual meeting at which he was elected to the close of the next annual meeting, when he shall automatically become President. As President he shall serve to the close of the next succeeding annual meeting. However, in case of the inability of the President to complete his term for any reason, the President-elect shall at once succeed to the duties of President, filling the unexpired term of his predecessor and his own term consecutively. Other officers, except the Chairman of the Executive Board and the Executive Secretary, shall serve from the close of the annual meeting when elected until the close of the next annual meeting, and all officers shall serve in any case until their successors are elected and qualified. A majority vote of the Councilors voting shall be required to elect, and if no candidate receives a majority vote on the first ballot, the candidate receiving the smallest number of votes shall be dropped after each ballot in succession until a majority vote is obtained.

The Chairman of the Executive Board and the Executive Secretary shall be elected by the Executive Board, which Board shall define the duties and authority of these officers, respectively.

#### ARTICLE VII EXECUTIVE BOARD

*Section 1.* There shall be an Executive Board, consisting of the President, the President-elect, the Treasurer, and six members, to be known as the Elective Members, elected for terms of three years each by the Governing Council. The Elective Members shall be at the time of their election past or present members of the Governing Council. The terms of the Elective Members shall begin at the close of the annual meeting at which they are elected and terminate at the end of the annual meeting at the expiration of their respective terms. The terms of two Elective Members shall expire each year in rotation.

*Section 2.* Acceptance of membership on the Executive Board shall terminate any appointment such Fellow may hold on any of the standing committees of the Association.

*Section 3.* It shall be the duty of the Executive Board to direct the administrative work of the Association; to act as the Trustee of the Association's properties; to elect the Members and Sustaining Members; and in general to carry out the policies of the Governing Council between meetings of the latter.

It may designate an Assistant Treasurer whose powers shall be limited to the disbursement of funds in accordance with duly authorized budgets for the ordinary conduct of Association business. Such power shall be exercised only during a period when, in the opinion of the Board, an emergency is created due to the absence or disability of the Treasurer. Such Assistant Treasurer may be a Fellow or a corporate fiduciary institution.

In the event of a vacancy in the office of Treasurer, the Executive Board shall have power to elect a Fellow to serve as Treasurer for the unexpired term.

It shall have such further powers and duties as may be prescribed in the By-Laws.

*Section 4.* A Quorum of the Executive Board shall consist of five members.

#### ARTICLE VIII AMENDMENTS

This Constitution may be amended by a two-thirds vote of the Fellows of the Association present and voting at an annual meeting, provided that the specific amendment to be acted upon is published in the official publication of the Association not less than thirty days prior to the meeting, and provided further that the amendment receives the approval of the Governing Council.

## BY-LAWS

## ARTICLE I FELLOWS

*Section 1.* Professional health workers who have been members of the Association for at least two years, and who are of established professional standing in the field of public health (whether employed by public or private organizations or in independent private practice) shall be eligible for election as Fellows, provided that the applicant shall have reached his thirtieth birthday at the time application for Fellowship is made and subject to the further conditions of this Article.

*Section 2.* The following persons shall be considered to have an established professional standing in public health for this purpose:

(a) A person who has rendered acceptable service for two or more years in a responsible public health position and who has been awarded in course a degree of Doctor of Public Health, Doctor of Science in Public Health, Doctor of Philosophy in Public Health, Doctor of Medicine with at least one year of graduate study in public health in a university, Master of Public Health, Diploma in Public Health or other equivalent degrees, according to standards approved by the Executive Board of the American Public Health Association.

(b) A person who has been awarded in course an academic or professional degree involving training in public health and who has been regularly engaged in health work for at least five years, having rendered meritorious service as a health officer or in responsible charge of work in either a public or private health agency.

(c) A person who has done notable original work in public health or preventive medicine of a character to give him a recognized standing.

(d) A person regularly engaged in health work for at least five years, who has given evidence of special proficiency, who has attained a recognized standing.

(e) A teacher of public health or one of its constituent sciences who has attained distinction as an expounder of the principles of public health or its constituent sciences. Such a teacher shall have had at least five years' experience as a teacher of public health subjects. Any years of experience as defined in paragraphs (b) and (d) that the applicant may have had shall be considered the equivalent

of the same number of years' experience as a "teacher."

(f) A person not covered by the above, who has made substantial contributions to public health work in his chosen branch and who has attained a recognized professional standing.

*Section 3.* Every application for Fellowship shall be made on an approved form and shall be sponsored by two Fellows of the Association who shall be Fellows of the Section with which affiliation is desired, provided, however, that when affiliation with a Section is not desired, the sponsors may be any two Fellows in good standing in the Association. Fellows without Section affiliation shall be known as unaffiliated Fellows.

*Section 4.*

(a) When an application has been duly sponsored and otherwise completed, it shall be transmitted to the Administrative Office of the Association, which shall make note thereon of such knowledge as it may have concerning the standing of the applicant in the Association. The application shall be forwarded by the Administrative Office to the Secretary of the Section in which affiliation is desired for the action of the Section Council, and, when acted upon by the Section Council, he shall return it to the Administrative Office after he shall have endorsed thereon the action of the Section Council. When the application is for unaffiliated Fellowship, the Executive Board of the Association shall act in place of the Section Council. To be eligible for election, individuals applying for Fellowship under the provisions of subsections (a) and (b) of Section 2 of this Article shall require for approval a majority vote of the Section Council or the Executive Board. All other applicants shall require for approval a two-thirds vote of such Section Council or the Executive Board.

(b) When the application has been approved by the Section Council or the Executive Board, as above provided, it shall be voted upon by the Committee on Eligibility. Applications requiring a majority vote of the Section Council or Executive Board shall require for approval a majority vote of the Committee on Eligibility. All other applications shall require unanimous approval of the Committee on Eligibility. If approved, as above specified, and provided the name of

the applicant shall have been officially published at least fifteen days in advance, the application shall be voted upon by the Governing Council, and if approved by three-fourths of the vote cast, the applicant shall be declared elected a Fellow.

#### Section 5.

(a) A Fellow may belong to and vote in only one Section, but such affiliation may be transferred to another Section if approved by vote of a majority of the Council of the latter Section. Unaffiliated Fellows may become affiliated with a Section if approved by vote of a majority of the Council of the Section with which affiliation is desired.

(b) Fellows shall have all the rights and privileges provided for Members in addition to those specifically reserved to them by the Constitution and By-Laws.

Section 6. Honorary Fellows may be elected by a three-fourths vote of the Governing Council for distinguished service in public health. Honorary Fellowship shall not confer voting power but Honorary Fellows who have previously been Fellows of the Association shall retain all the privileges of Fellowship.

### ARTICLE II MEMBERS

Section 1. Persons professionally engaged or interested in public health work shall be eligible for election as members by a three-fourths vote cast by the Executive Board when sponsored by two members or Fellows and after approval by the Committee on Eligibility. They shall be entitled to receive the official journal of the Association, to vote for the officers and members of the Council of the Section with which they are affiliated, and upon all motions and resolutions coming before such Section, to participate generally in its proceedings and to serve on committees, except as provided in the Constitution and By-Laws. A member may belong to and vote in only one Section, but such affiliation may be transferred to another Section if approved by vote of a majority of the Council of the Section to which change is desired. Unaffiliated members may become affiliated with a Section if approved by vote of a majority of the Council of the Section with which affiliation is desired.

Section 2. Individuals or corporations interested in public health may be elected to Sustaining Membership by a three-fourths vote of the Executive Board. Sustaining Members shall be entitled to receive the journal and such other publications of the Association as the Executive Board may designate.

Section 3. Upon the recommendation of the Committee on Eligibility, any individual member or Fellow of the Association may be elected a member for life. The dues for Life Members shall be \$100.00, payable within one year after election. Election to this grade shall not affect the privileges held by such an individual as a regularly elected Member or Fellow.

### ARTICLE III AFFILIATED SOCIETIES

Section 1. A state or provincial public health association or similar regional society including more or less than a state, primarily composed of professional public health workers and organized for the same general objects as the American Public Health Association, may be elected by a three-fourths vote of the Governing Council as an Affiliated Society, provided that not less than twenty of its active members and at least one-half of its active members are members or Fellows of the American Public Health Association. Not more than one such society shall be admitted from the same area.

Section 2. A society applying for affiliation shall submit a copy of its constitution and by-laws, its last annual budget, a roster of its members, and such other evidences of its qualifications as may be required. It shall submit annually and at other times such reports on its financial standing, membership, and other matters as may be required by the Executive Board of the American Public Health Association.

Section 3. The Committee on Eligibility shall consider all applications for affiliation and report its recommendations to the Governing Council.

### ARTICLE IV DUES

Section 1. Honorary Fellows and Life Members shall be exempt from the payment of annual dues. The dues of all other constituents are payable annually in advance.

Section 2. The dues for Members shall be \$5.00, for Fellows \$10.00, and for Sustaining Members \$100.00 or more.

Section 3. The dues for Affiliated Societies shall be one per cent of their gross annual income, provided that the minimum dues per society shall be \$10.00 per year, and provided further that for every Fellow or Member paying annual dues to the American Public Health Association, the Association shall remit to the Affiliated Society of which such person is a member the sum of \$1.00 per annum.

### ARTICLE V DISCONTINUANCE OF MEMBERSHIP

Section 1. Constituents of any class whose

dues are unpaid for six months or more shall be considered not in good standing. Constituents not in good standing shall not be entitled to any of the privileges or powers of membership, Fellowship, or affiliation. Good standing may be resumed upon the payment of all arrears and dues in advance for one year, provided the lapsed period is not greater than one year. The Administrative Office shall notify by registered mail all constituents who have been in arrears for a period of eleven months. The names of constituents in any class whose dues remain unpaid for one year or more and who have been duly notified as above provided shall be presented to the Executive Board which shall order the names of such constituents stricken from the membership roll. Constituents whose names have been stricken from the rolls in this manner may be again admitted in the manner provided for the election of new constituents in the class for which they make application, provided such person or organization complies with the eligibility requirements at the time the new application is made.

*Section 2.* If, in the opinion of the Executive Board, any member or Fellow of the Association permits the use of his name, or otherwise allows himself to be quoted or used for illustration in the advertising of a commercial product, in such a manner as to reflect discredit upon the Association, his Fellowship or membership in the Association shall thereupon be terminated.

*Section 3.* Upon the recommendation of the Committee on Eligibility the Governing Council may discontinue the membership, Fellowship or affiliation of any constituent. Three-fourths of the votes cast shall be necessary for such action.

#### ARTICLE VI PUBLICATIONS

*Section 1.* All publications of the Association and of its Sections shall be issued under the direction of the Executive Board.

*Section 2.* *The American Journal of Public Health* shall be the official journal of the Association. The Executive Board shall appoint a Managing Editor of the official journal and an Editorial Board of not less than five members to serve at the pleasure of the Executive Board. All papers and reports for the annual meetings are to be accepted with the understanding that they shall be the property of the Association for publication, unless this right is waived by the Managing Editor.

#### ARTICLE VII ELECTIVE COUNCILORS

*Section 1.* The Elective Members of the

Governing Council shall be nominated and elected as follows:

There shall be a Nominating Committee composed of one Fellow elected by each Section at the preceding annual meeting, and an additional Fellow designated by the Executive Board, the latter serving as Chairman.

This committee shall present to the Administrative Office at least two months before the next annual meeting the names of at least twenty and not more than thirty Fellows of the Association selected with due regard to geographical and membership considerations as nominees for the Governing Council.

Upon the petition of twenty-five Fellows the Nominating Committee shall add the name of any Fellow to the nominees selected by it, provided such petition is received not less than fifteen days before the annual meeting.

*Section 2.* The Administrative Office shall publish to the membership not less than thirty days prior to the annual meeting the nominees selected by the Nominating Committee. Prior to the annual meeting it shall prepare ballots upon which the names of all nominees shall appear in order determined by lot and one such ballot shall be handed to each Fellow entitled to vote at the annual meeting upon his signing a receipt therefor.

*Section 3.* The polls for the reception of ballots shall be open at 9 A.M. on the first day of the annual meeting and shall close at a time to be determined each year by the Executive Board prior to the opening of the polls.

*Section 4.* The Fellows receiving the highest number of votes on a written ballot cast by the Fellows present and voting at the annual meeting shall be declared elected to fill existing vacancies. Should two or more candidates receive the same number of votes, the Governing Council shall, when necessary, determine by written ballot the order of precedence of such candidates.

#### ARTICLE VIII EXECUTIVE BOARD

*Section 1.* The Executive Board shall elect from its own membership a Chairman who shall serve in that capacity for such term as the Executive Board shall determine. It shall also designate such other officers of the Board as it may require for the conduct of its business.

*Section 2.* If a vacancy among the Elective Members of the Executive Board shall occur after the annual meeting, the President shall designate a nominating committee from the Governing Council. Such committee shall

nominate not less than three candidates for the vacancy, from among whom the candidate receiving the highest number of votes of the Governing Council in a mail ballot shall be declared elected to the Executive Board to fill the vacancy.

*Section 3.* In addition to those prescribed in the Constitution and in these By-Laws, the Executive Board shall have the following powers and duties:

(a) To plan methods for the procurement of funds.

(b) To approve the budgets for the Association's work.

(c) To conform to the policies of the Governing Council in the conduct of its work.

(d) To designate the chairmen of the standing committees, to appoint their members unless otherwise provided in these By-Laws. To authorize the establishment of all other Association committees and confirm the appointment of their members.

(e) To transmit a report of its proceedings and transactions to the Governing Council at least thirty days before each annual meeting.

*Section 4.* After two consecutive terms of three years an elective member of the Executive Board, except one serving as chairman, shall be ineligible for reelection during one Association year.

## ARTICLE IX NOMINATION OF OFFICERS

The officers elected by the Governing Council shall be nominated from the floor by that body.

## ARTICLE X STANDING AND SPECIAL COMMITTEES

*Section 1.* There shall be four standing committees of the Association as follows:

(a) Committee on Eligibility.

(b) Committee on Administrative Practice.

(c) Committee on Research and Standards.

(d) Committee on Professional Education.

*Section 2.* Each standing committee shall designate from among its membership such officers as it may require for the conduct of its business and shall control its policies within the limitations prescribed by the Governing Council and the Executive Board. The Executive Secretary shall be a member, ex-officio, and serve as secretary of each standing committee.

*Section 3.*

(a) The Committee on Eligibility shall consist of one Fellow to be elected by each Section and an additional Fellow elected by the Executive Board who shall serve as

Chairman. Members shall serve for a term of two years.

(b) This committee shall pass upon the eligibility of Fellows, members and other constituents in accordance with the provisions of the By-Laws.

*Section 4.*

(a) The Committee on Administrative Practice shall consist of fifteen Fellows, twelve of whom shall be designated by the Executive Board to serve for a term of four years, the terms of three members expiring each year, and three of whom shall be elected annually by and from the Fellows affiliated with the Health Officers Section.

(b) This committee shall engage in the collection of information regarding current public health practices and analyze the material obtained to derive standards of organization and achievement. The findings and standards may be made available to public health workers through publications, information and field service under such conditions as the committee may establish. No standards shall be promulgated as the official and authorized judgment of the Association except with the approval of the Governing Council.

*Section 5.*

(a) The Committee on Research and Standards shall consist of fifteen Fellows representative of the various Sections of the Association appointed by the Executive Board. Members shall serve for a term of three years, the terms of five members expiring each year.

(b) This committee shall be responsible for carrying out research and the development of standards in the technical branches of public health service, and shall coordinate such research and standardization. This committee shall also be charged with the duty of reviewing from time to time standards already established. No standards shall be promulgated as the official and authorized judgment of the Association except with the approval of the Governing Council.

*Section 6.*

(a) The Committee on Professional Education shall consist of twelve Fellows appointed by the Executive Board. Members shall serve for a term of three years, the terms of four members expiring each year.

(b) This committee shall be responsible for carrying out research and the development of standards for professional education and training in public health work and shall perform such other functions as may be delegated to the committee by the Governing Council with the view of maintaining professional qualifications of high standard. No standards shall be promulgated as the official

and authorized judgment of the Association except with the approval of the Governing Council.

*Section 7.* Unless otherwise provided in these By-Laws, all other Association Committees shall be authorized and appointed by the Executive Board and the appointments of their members shall expire at the next annual meeting.

## ARTICLE XI SECTIONS

*Section 1.* The Executive Board shall approve rules and regulations relating to the government of the Sections, and to the appointment of administrative committees. Each Section shall elect its own officers and shall name its respective Section committees. The right to hold office or to serve as a member of a Section Council or as chairman of a committee in a Section shall be limited to the Fellows affiliated with such Section.

### *Section 2.*

(a) The Section Chairman, with the advice of the Section Council, shall appoint a Committee on Nominations from the Fellows affiliated with the Section at least fifteen days before each annual meeting. The Section Secretary shall be a member of such committee.

(b) The names of the members of the Committee on Nominations shall be announced at the first meeting of the Section at each annual meeting of the Association. The Committee on Nominations shall present at the second meeting of the Section a list of nominees for the Section officers, and for membership in the Section Council; provided that if the name of any Fellow be transmitted to the Nominating Committee over the signature of ten Fellows of the Section prior to the second meeting of the Section, the Nominating Committee shall add the name of such Fellow to its own list of nominees.

*Section 3.* The officers of each Section shall be a Chairman, a Vice-Chairman, and a Secretary, who shall be the representatives of the Section to the Governing Council of the Association, except as provided in the Constitution.

*Section 4.* New terms shall begin and old terms shall expire at the end of annual meetings. After five consecutive years in any elective Section office, except that of Secretary, a member shall be ineligible to reelection to that office during one Association year.

*Section 5.* The Chairman, or in his absence the Vice-Chairman, shall preside at meetings of the Section.

*Section 6.* The Secretary shall prepare the scientific program of the Section for the annual meeting, subject to the recommendations

of the Section Council, and shall submit same to the Administrative Office. He shall keep the minutes and other records of the Section, and shall transmit to the Executive Secretary of the Association a copy of the minutes of both the business and scientific sessions as soon as practicable after the close of the annual meeting of the Association. When unable to be present at meetings, he shall thoroughly instruct a substitute as far in advance of the meeting as possible.

*Section 7.* There shall be a Section Council composed of the three officers of the Section and five members, to be known as the elective members, each of whom shall be elected for a term of five years; provided that when a Section is first established one member shall be elected to serve for one year, one for two, one for three, one for four, and one for five years.

*Section 8.* The duties of the Section Council shall be:

(a) To recommend papers, and to make general recommendations in relation to the annual meeting program.

(b) To advise on Section membership and on Section policies.

(c) To submit annually to the Governing Council through the Executive Board a report of the transactions of the Section.

(d) To report annually to the Governing Council through the Executive Board on the plans, scope and policy of the Section during the succeeding year.

(e) To formulate rules of procedure for the Section.

(f) To consider and transmit to the Governing Council resolutions originating in the Section. Only resolutions approved by the Governing Council shall be published as representing the policy of the Association.

(g) To advise on the publication of papers and reports presented at the Section meetings.

(h) To advise with respect to the appointment of technical committees, subcommittees, or Section representatives on committees of the Association.

## ARTICLE XII FINANCES

All remittances to the Association shall be deposited to the account of the Treasurer. The Treasurer shall be custodian of investments of the Association and shall disburse funds in accordance with duly authorized vouchers. With the approval of the Executive Board he may establish a drawing account for the Executive Secretary, who shall send to members of the Executive Board a financial summary of receipts and disbursements each month. Once each month, or oftener if called

for, he shall also forward to the Treasurer and to the Chairman of the Executive Board an itemized statement of all expenditures. The Executive Secretary, the Treasurer and the Assistant Treasurer shall be bonded at the expense of the Association in an amount to be determined by the Executive Board. The books of the Association shall be audited annually by certified public accountants to be appointed by the Executive Board.

#### ARTICLE XIII MEETINGS OF THE ASSOCIATION

There shall be one general meeting of the Association, to be known as the annual meeting which shall be held each year at a place selected by the Governing Council. Special

meetings of the Association may be called by a majority vote of the Governing Council, the Executive Board, or the Association. In all proceedings of the Association, *Robert's Rules of Order* shall be official.

#### ARTICLE XIV AMENDMENTS

These By-laws may be amended by a two-thirds vote of those voting on the Governing Council during the annual meeting, provided that twenty-four hours prior written notice thereof has been given. The By-laws may further be amended by a two-thirds vote of those voting at any meeting of the Governing Council called for the purpose, provided that notice thereof shall have been given at least fifteen days prior to such meeting.

# Public Health Work in England: How It Is Like and Unlike Ours.

*London letter by the Roving Editor of the American Journal of Public Health*

MARGARET G. ARNSTEIN, R.N., M.P.H., F.A.P.H.A.

THIS is a particularly interesting time to be in England observing health work, for the new National Health Service Bill is being debated now in Parliament and consequently the health work of the nation is discussed frequently and prominently in the newspapers and is at the forefront of everyone's mind. However, the very fact that one is present during a period when great changes in the present system are imminent makes it more difficult to give any report which will not be out of date by the time it is printed.

Nothing less than a full length book would suffice to describe all the things which seem to this observer to be of special interest to American health workers, to say nothing of any consecutive account of the scope and content of health work in the British Isles.

It has been difficult to choose from the things heard and seen those which can fit together into the confines of a letter from England. However, a few of the problems and achievements which strike one's attention because of their amazing similarity to ours, and in a few which stand out as differing quite sharply from our practices, are presented here.

## A MULTIPLICITY OF HEALTH AGENCIES OPERATE IN A COMPLEX GOVERN- MENTAL STRUCTURE

Health departments in England provide not only all the services habitually performed by our health departments, but also housing, and many functions

which are usually carried out by our welfare departments, such as the administration of public hospitals, children's institutions and foster homes.

In England as in the United States there are numerous agencies carrying on various health functions in an equally complicated governmental framework. In a county the tuberculosis and venereal disease work may be administered by the County Health Authority (County Health Department) for the whole county. This same body may administer the maternity, infancy, and preschool work in certain parts of the county, while a dozen or more municipal boroughs (cities) and urban districts (villages) within the county administer their own communicable disease programs and perhaps also their own maternity—infancy programs. Certain cities, called County Boroughs, are entirely independent of the County Health Authority and administer all health services within the city.

The school health work<sup>1</sup> is administered by the education authorities, though coördination of work is achieved in Great Britain by the Medical Officer of Health also being the School Medical Officer. There are also many voluntary agencies operating alongside the official. There are district nursing associations in almost every county in England, and in all but 10 of the 61 administrative counties in England and Wales these associations are affiliated with the Queen's Institute of District Nursing. Such organizations as the National



Association for the Prevention of Tuberculosis and the Crippled Guild may hold clinics and even run hospitals in certain areas; the British Empire Cancer Campaign provides facilities for diagnosis and treatment in association with voluntary hospitals, and the British Red Cross carries on a multiplicity of peacetime activities, to mention but a few of these voluntary agencies.

As an example of the complexity of organization, in one large quite typical county visited, the County Health Authority employs 36 health visitors and 53 midwives. The health visitors do the tuberculosis work for the entire county, the maternity and infancy work in part of the county, and the school nursing in the entire county with the exception of 6 areas where the Education Authority employs 6 full-time school nurses. The midwives cover the whole county, many parts of which are also served by the District Nursing Association nurse-midwives. Seventy-seven district nurses in this county are employed by 61 separate associations affiliated with the County Nursing Federation which, in turn, is part of the Queen's Institute of District Nursing. The County Nursing Superintendent (nursing supervisor) supervises the nurses in these associations and coordinates their work. There are another nine district associations in the county which are not affiliated with the County Federation but which work independently.

The above presents a picture in only one branch of the health service, other branches such as clinic and hospital services being almost as complicated, voluntary agencies offering services in certain places and not others, hospitals serving parts of the county, or taking certain types of cases from other counties.

This type of organization with its multiplicity of agencies and overlapping of services is an all too familiar pattern

to us in the States and is deplored in Britain as much as it is at home. However, there is a definite prospect that the situation will at least be partially remedied by the National Health Service Bill which unifies the official services under the major local authorities, counties and county boroughs (cities), so that when the Bill is passed minor local authorities (small cities and villages) will transfer whatever health activities they are now conducting to the County Health Authority.

#### REGIONALIZATION OF HOSPITALS

The National Health Services-Bill will also break down boundaries in relation to hospitals, which are to be grouped into regions and administered by Regional Boards, not by local health authorities or voluntary boards, as they are now. The regions are planned around the existing medical teaching centers. Hospitals within the region will serve their "natural" areas, not necessarily a governmental unit, population grouping and transportation facilities being the factors defining an area rather than boundaries of cities or counties. Voluntary hospitals will be included in this scheme, for they are to be taken over by the government.

This scheme for the regionalization of hospital services resembles closely the plans which many public health workers in the United States have been making, writing about, and hoping to see in operation. At this moment a similar plan is being tried out in and about Rochester, N. Y., with the assistance of private funds, and the Hospital Construction Act passed by Congress enables the U. S. Public Health Service to promote and assist with the development of similar plans in the various states. It is therefore intensely interesting to see another country in the throes of putting these ideas into practice, getting down to practical details of administration, such as the employment

and assignment of personnel. (Though the National Health Bill has not been passed yet as this is written, there seems no doubt that it will pass in substantially its present form.)

#### GENERALIZATION VERSUS SPECIALIZATION IN PUBLIC HEALTH NURSING

Another familiar problem under discussion here is the extent to which public health nursing activities should be generalized. It seems "just like home" to find that in some areas there are three groups of nurses, health visitors (Board of Health nurses), school nurses and district nurses, while in others the health visitor does the school nursing and board of health work, and in the most rural areas one nurse does the work of all three groups, including midwifery.

The planning and operation of a generalized public health nursing service which includes midwifery is more difficult than one which does not offer this service, as those in the United States who have included delivery nursing service in their program know. However, it seems to offer fewer difficulties here, at least in the rural areas, than at home. The nurse midwives are left to plan their own time off and to arrange with a neighboring nurse to take their calls if they wish to go away for an afternoon or evening, but a relief nurse is supplied from county headquarters for more extended periods off duty. The midwife like the physician is always "on duty" and must always leave word where she can be reached. Many American public health nurses would feel tied by this system and would want a regular schedule of time off duty. As far as one can tell by contact with only a few district nurse midwives, they seem to be content. Their independence plus the interests and responsibilities of midwifery seem to compensate for so little time off call. The number of hours actually on duty is very variable, of

course, but in the county visited was seldom more than 40-44 hours a week. However it must be noted that there is an extreme shortage of midwives and it is thought that the hours of work may be one of the factors discouraging nurses from practising midwifery, though it is certainly not the only factor.

The trend here, as at home, is toward more generalization, and the same questions arise as to how far one can carry this policy and in which places it is practical.

#### VOLUNTARY AGENCIES AND HEALTH EDUCATION

The Central Council for Health Education, which was established to co-ordinate the health education activities of some fifty national health agencies, is of particular interest to us at the present moment while the Gunn-Platt report is being discussed and acted upon in communities all over the United States. This Council does not attempt to coördinate the total program of the various agencies but it does act as a clearing house for their health education activities, and produces materials for all of them. The Council is supported by a grant from the Ministry of Health and grants from the local authorities and thus is also an official agency doing a large part of the health education work for the Ministry of Health. The Council prepares and distributes literature on all phases of health and, in spite of paper shortage and printing difficulties, many of these pamphlets are so readable, attractive and eye-catching that one wishes JOURNAL readers could see them, not merely hear about them. Movies, radio programs and lecture material are also prepared and distributed locally.

In addition to the central office in London there are 13 regional offices. The staff members in these regional offices work directly with local medical officers of health, advising and assisting

them in planning special campaigns. They not only draw up a budget for the campaigns and indicate sources of material, or voluntary organizations equipped to assist them, but they may also work with local groups in organizing the work. We have found this type of assistance from trained health educators of tremendous value in the few places where it has been tried on a more or less experimental basis. England is already carrying out this scheme on a national basis, though shortage of trained personnel has to date limited the amount of assistance given to local health authorities.

What the future of the voluntary agencies will be no one knows. As has been stated, the new National Health Bill provides for the government taking over all voluntary hospitals and, though it is not quite clear yet what will happen to the largest operating voluntary organization, the Queen's Institute of District Nursing, it seems fairly certain that there will be important changes in the financing of this agency as well. It is too soon for anyone to say how the Act will affect other voluntary agencies.

#### MINISTRY OF HEALTH CAMPAIGN FOR DIPHTHERIA IMMUNIZATION

The Ministry of Health has a public relations division of its own which carries on certain phases of the health education program not covered by the Central Council for Health Education. It gives material to the women's magazines regularly and frequently and to the newspapers, though the extreme shortage of newsprint has limited newspaper publicity. The Ministry of Health also has certain moving pictures made, does some radio broadcasting, and carries on national campaigns, such as that against diphtheria.

Americans are rather apt to think of the English as slow moving or at least not "pushers." The success of the

diphtheria immunization campaign is an example of the danger of all such generalizations. In four years the immunization status in the whole country was raised for children under 16 from 5 to 58 per cent and for those under 5 from almost zero to 50 per cent.

This was done through intensive campaigns of education and persuasion, not regulation, much as we did when we started to promote diphtheria immunization some years ago. England, perhaps partly because it is smaller and more homogenous, has achieved a greater uniformity of success over the whole country in four years than we have in fifteen years. Much the same methods have been used: education of the public through posters prominently and widely displayed in all public places and through radio programs, literature, and talks, and, most effective here, as at home, the visits of the public health nurse. Great Britain is as free from centralized dictatorship rule as we are, so this campaign had to be carried out by fifteen hundred separate local health authorities. A survey made for the Ministry of Health in October, 1945, showed a remarkably high performance from almost all the local authorities. This survey found that very few people (only 1 per cent of mothers whose children had been immunized) reported any difficulty in getting the immunization done, an indication that the local authorities had made facilities easily available and had publicized them well.

These are a few of the features which seem very similar to our problems and achievements. There are many others in this category, such as the difficulty in obtaining sufficient nurses for public health work or hospitals, the equal difficulty of obtaining domestic staff for hospitals, the acute shortage of personnel in tuberculosis and mental hospitals, all of which are in the forefront of everyone's thoughts.

#### WHY SOME HEALTH PRACTICES DIFFER FROM OURS

There are also many strikingly different practices and viewpoints, some of which appear to be due to the differences in geography and size of the two countries.

For instance, it has been possible entirely to eliminate rabies by quarantine regulations at the ports, an achievement which would be almost impossible in a country like the United States. Similarly, though only about 30 per cent of the children born each year are vaccinated against smallpox, there has been no widespread outbreak for some years. Smallpox vaccination has been compulsory, but a waiver allowing exemption was so easy to obtain that less than one-third actually were vaccinated. The new National Health Bill removes the compulsory vaccination feature because the regulation as it now stands is a farce. In view of the great success of the diphtheria immunization campaign one might expect health officials to be preparing similar campaigns for voluntary vaccination, but such apparently is not the case at the present time. In spite of the fact that airplanes have reduced the importance of seaports as quarantine stations and disease barriers, there is still a strong feeling among the local health officials met in the course of these observations that smallpox, if introduced, could easily be controlled. They feel that the risk is relatively small and, in view of the strong public prejudice against vaccination, it would not be worth the time and expense to try to overcome it at the present time.

Many more of the differences in health practices are due to the differences in our two social structures and the degree to which not only medicine but other phases of life have been socialized here and are being rapidly brought more and more under governmental control. This is such an important and fundamental difference,

influencing every health activity no matter how minute, that great readjustments in thinking are needed if the American visitor is not to make mistakes in analyzing the health work in England.

Another fact which must also be kept constantly in mind is that most of the obstetrics is done by midwives, which influences not only the care of the patient, but also such related practices as personnel policies for district nurses, and the number of physicians needed in an area.

#### FOOD DISTRIBUTION IN ANTEPARTUM AND INFANT CLINICS

Post-war shortages, rationing of food and clothing, and the difficulties of shopping also play an important part in determining certain policies and practices. For instance, to an American public health worker it is surprising to see orange juice, prepared dried milk formula powders, vitamin preparations, and certain other foods sold or given free at all well run baby and prenatal clinics. This is done to simplify the mother's life a little, as it cuts out some tedious visits to the food office. Even a short period of housekeeping in England makes one appreciate any procedure which reduces the number of places one has to go and the number of times one had to stand in line. One argument we use at home against giving food at clinics does not apply here, others do not fit into their social philosophy. We say one should not mix "relief" with health work, but this is not relief in our sense, for all pregnant women, regardless of financial status, are entitled to these foods at the reduced clinic prices, and one item, orange juice, can only be obtained at the clinic or the food office. The shortage of many protective foods has made supplementary vitamins essential and, though they are obtainable in the shops, they cost much less at clinics. The aim in Great Britain is to make sure that no mother

or baby should be deprived of necessary foods for lack of funds, and it is not thought advisable to depend only on educating the mother to plan her budget so that she can buy these items on the open market. In the United States we think that we should educate mothers to attend clinics for the medical and nursing supervision they receive and that they should not come in order to get "hand outs." The English public health workers think that, as long as they come to the clinic and remain under supervision, the reason for their attendance is unimportant.

Whether one thinks distributing food at clinics is good or bad, one must come to a conclusion only after careful study of the whole situation in England, and probably it takes longer than a few months to understand all the implications and consequences of this policy.

Another factor which has a bearing on the situation is the high percentage of women who attend prenatal clinics. Seventy-six per cent of the mothers of all babies born in 1944 attended prenatal clinics! This is an amazing figure, probably not equaled anywhere in the United States. Though some may come and come early in order to get a physician's certificate, without which they cannot get their extra food and clothing coupons—others in order to reserve a hospital bed—this is probably not a very large factor, for in 1938 sixty-one per cent of all prenatals attended clinics and this number was then on the increase.

The large number of prenatals attending clinic has resulted in very overcrowded clinics. Examinations and interviews are necessarily brief and little teaching can be done in clinic. The shortage of medical and nursing personnel has made it impossible up to date to increase the number of clinic sessions, but in each area visited, plans have been made to remedy this situation as soon as more personnel are available.

#### MATERNITY CARE—POSTPARTUM PERIOD

Though 76 per cent of the prenatals attended clinic during the antenatal period, only a very small percentage attended postnatal clinics. The postnatal clinic service has received attention only recently and is now growing. On the other hand, a longer lying-in period is thought to be important. Again, in addition to the physiological reasons for the practice, there are war-time and post-war conditions which have a bearing on it. All mothers are expected to stay in the hospital for 14 days after the birth of the baby, except when there is an acute shortage of hospital beds, when this period has been reduced to 10 days. When the baby is born at home (and a much higher percentage are born at home than in the United States), a midwife or district nurse visits twice a day for the first 3 or 4 days, then daily until the 14th day postpartum. This longer lying-in period is thought to be important in the establishment and maintenance of breast feeding even in normal times, and during the war was doubly important, for it was impossible to get friends or relatives to help at home, since all women had to work. Nor, as has been pointed out, is housekeeping ever "light" as it inevitably entails standing in one line after another and carrying heavy parcels.

Perhaps it is just these difficulties that have stimulated the local health authorities to extend, and in some areas initiate, a project which had been operating in a small way before the war. "Home helps," domestic workers employed by the health authority, are supplied as needed, either free or at small cost. This scheme has proved so useful that the new National Health Bill makes it a permanent function of health departments.

It is most interesting to see in operation here some of the projects which are still in the discussion or experi-

mental stage at home. The provision of "home helps" is one example; another was seen in a maternity hospital in the City of Luton. Numerous papers have been presented recently in American medical and public health journals regarding the desirability of placing the infant in the same room as the mother during the puerperium. Discussions of these papers have raised questions regarding the practical nature of such a plan and the difficulty of insuring the mother's rest. The maternity hospital at Luton takes care of all these questions. It is a delightful modern building with an atmosphere of quiet and cheer which is ideal for maternity care. At the time of visit, there were no more than 4 mothers to a ward, and each mother had her baby next to her. The babies are taken out at night, thus solving the sleep problem, and they may be, and often are, taken out in the daytime if advisable for either mother's or baby's health or peace of mind. Putting mothers and infants together is a common, though not universal, practice in England and as seen in this one hospital seemed ideal.

#### BREAST FEEDING

We talk a great deal about breast feeding at home, but they do more than talk about it in England. Again a small social factor exerts quite a large influence. Refrigeration is the exception, not the rule, here and the milk is apparently not of the same high quality as found in the larger cities at home (judging from newspaper accounts and comments of health officials); consequently it is harder to keep a formula fresh. However, these facts simply indicate why it is even more important to breast feed here than it is in America, and give added weight to the more fundamental reasons for breast feeding.

Much care and attention are given to establishing and maintaining breast feeding. As has been mentioned, the

midwife visits daily for 14 days, then the health visitor starts visiting on the 15th day if possible. Though, of course, the success of the physician and midwife and health visitor in maintaining breast feeding varies in different areas, it is generally much higher than at home and the expectation of the goal that should be reached is even higher. The pediatricians here deplore the fact that only 80 per cent of the babies born in hospitals are entirely breast fed at the end of 2 weeks. A pediatrician in a health department was heard to say that it was "appalling" that after 3 months only 50 per cent of the babies were breast fed and that this number had dropped to 40 per cent after 6 months!

In addition to the regular antenatal clinics there are special clinics for consultation regarding breast feeding for the more difficult cases, and some of the regular antenatal clinics are doing intensive work in this field and getting excellent results. A demonstration and lecture on breast feeding was attended at the British Hospital for Mothers and Babies, one of the clinics which are doing special work on breast feeding. The methods demonstrated there and results obtained are worth a separate article dealing with breast feeding.

The infant, after his first 14 days, continues to be the object of active health department interest. Ninety-six per cent of the infants born in 1944 were visited by health visitors. The health visitor aims to visit all infants regularly regardless of their attendance at clinics or any special problems. Actually, as the health visitor always has more work than she can do, she is apt to visit those who do not come to clinics more often than those who attend clinic regularly. The emphasis placed on this branch of health work by the health visitor is indicated by the fact that her work load is measured in terms of the number of births in her area, not in terms of the total population.

Articles analyzing maternal and infant deaths in relation to various obstetrical practices and socio-economic factors, including those produced by war, can be found in the literature. Numerous studies of the nutritional status of wartime England have also appeared in print, therefore no attempt has been made to present figures related to the practices observed. However, this observer can report that the infants and preschool children seen in clinics, nurseries, and in their homes certainly bear out the finding of the nutritional studies. As is well known, the nutritional status of children in England improved during the war and is now at a generally high level, and a healthier, huskier, firmer lot of babies this observer has never seen.

#### SCHOOL MEDICAL SERVICE

As startling as seeing food distributed in clinics, are the school treatment clinics. Minor ailment treatment clinics are part of the school medical scheme. They are usually located in a centrally situated school or in a separate building, and children are sent from other schools by the teachers or school nurses. The school system also operates free dental treatment clinics, eye clinics, and clinics for other specialties. Their services are available to all children in the schools equivalent to American public schools. There is no question whether a child is eligible for free care, or of sending him to his private physician, except of course for major illnesses. Apparently the shortage of physicians during the war, the 35 year old National Health Insurance scheme and system of "panel" doctors, has so influenced thinking on medical care that this prac-

tice is never questioned. There are few difficulties (except shortage of medical and dental personnel) in having a defect corrected once it is found. Sometimes parents do not agree to having the corrective work done, but apparently this is not frequent.

There are dozens of other things which clamor for space in this article, some just flashes from days in the field, some gleanings from conversation and discussions heard in the classroom, a lively meeting of the Royal College of Nursing addressed by the Minister of Health, a conversation in a bus with a health visitor, disconnected bits, but all thought provoking.

This opportunity to observe health work in another country has convinced this observer that there should be much more international visiting. It gives one a strong feeling of how closely bound the world is to see the identical problems in two different countries and meet almost the same wording in the descriptions of the difficulties involved in solving them. It is stimulating to see far advanced developments in certain directions toward which some of us have just taken the first steps, and it is refreshing to meet ideas so different from those voiced at home that one had not even recognized them as a legitimate point of view. Many English public health officials are planning to visit America and it is to be hoped that arrangements can be made for health officers and public health nurses from all parts of the United States to visit England.

#### REFERENCE

1. See Underwood, J. E. A. School Health Service in England and Wales. *A.J.P.H.*, 36, 7:703 (July), 1946.

## Credit Lines

### A PROPOSAL FOR THE SOLUTION OF THE RECRUITMENT PROBLEM

Among the memorable features of the events of the Annual Meeting relating to the Merit System Unit, was an appraisal of public health recruitment problems by Dr. Wallace H. Wulfeck, Vice-President and Director of Research of the Federal Advertising Agency. This discussion preceded the Cleveland meeting and served as an orientation for the panel members who participated in the Merit System Unit session at the meeting. The analysis presented by Dr. Wulfeck represents a significant departure from the traditional approach to recruitment in public health, and it is felt that the point of view Dr. Wulfeck expressed has a special claim to the attention of the general membership.

In many major respects the problems a public health agency confronts in seeking personnel parallel the problems a manufacturer meets in seeking a market for his product—the product in the case of the public health agency being, of course, a “profession” or “jobs.” It is quite conceivable that the large experience of advertising agencies could be brought to bear on the problems of the professional agency. The research approach which underlies modern advertising procedures might very well be applied in an effort to develop methods for attracting qualified people to the field of public health. Such research customarily proceeds by way of four major steps: an analysis of the product; an analysis of the market; the development of the actual advertising by creative technicians on the basis of the findings of the two preceding steps; and, finally, pretesting the advertisement thus created to determine its effective-

ness before it is released on a wide scale.

Powerful as the advertising approach can be, Dr. Wulfeck nevertheless felt that the particular problems posed by the public health field could be dealt with most effectively as a public relations problem. Through such a program, an explicit awareness of the function of public health in this culture, its right to public support and approbation and to the best personnel available could be developed, with the dignity it deserves, among the public as a whole and among the professions from which public health personnel are drawn. The same basic motives activate professional people as activate people in general. They, like all other human beings, are driven by a longing for security, for self-expression, for adventure, and for fellowship. These drives are abundantly present in public health endeavors but this fact must be made known to the people who have to be reached if the pressing problem of personnel in public health is to be solved.

This task can best be accomplished, Dr. Wulfeck believes, through the appointment of a highly qualified public relations person to head a nation-wide program. Although the public health field consists of fairly autonomous groups throughout the country, the public relations program should be a single, unified project. Not only would this mean a more efficient and economical venture, it would also avoid the diversification and weakening of appeal which would result from a number of local programs. Such a person could so raise the status of public health in the public mind that legislators would say, “This is the kind of program we must sup-



port"; voters would say, "This is the kind of man we want to elect"; and people would say, "This is what I want to do; this is my life."

The urgency of the personnel problem in public health is great, the significance basic, and the need to solve it imperative. Unless, Dr. Wulfeck, says, public health leaders adopt the techniques

which have so indisputably demonstrated their effectiveness in business and industry, the solution to its recruitment problems will be postponed indefinitely. "You do not," Dr. Wulfeck concluded, "have a choice with regard to your course in this. You cannot afford *not* to undertake this project."

#### HEALTH LEGISLATIVE RECORD

*Health Legislative Record, 1907-1946* is the forty-year chronicle of the outstanding health legislative program carried out in New York State by the state and local Committees on Tuberculosis and Public Health of the State Charities Aid Association. During the entire period Homer Folks has served as Executive Secretary of the Association, and George Nelbach Secretary of its State Committee on Tuberculosis and Public Health.

In 1908 the basic tuberculosis law of the state was drafted by the committee and its enactment secured; in 1909 the County Tuberculosis law was drafted and shepherded through the legislature.

The part of the committee and its citizen supporters in the Public Health Commission of 1913, and the public health laws resulting from it, in the passage of the county health unit law of 1921, in eliminating the "means test" for admission to tuberculosis hospitals, and in preparing the recommendations on which the Governor's Health Program of 1946 was based—these and many others are briefly summarized and constitute an impressive chronicle of citizen service.

Since the creation of the State Committee in 1907 it has served as the designated representative of the National Tuberculosis Association in New York State outside of New York City. It was the first of the state associations to receive permission from the national association to use funds from Christmas Seal sale

for the development of other lines of health work. It thus participated in the 1926-1930 diphtheria eradication campaign and is the up-state representative of the American Social Hygiene Association in the venereal disease control movement. The committee is the parent organization of 62 county and city tuberculosis and public health associations throughout the state.

#### CANCER CAPSULES

About the current size and shape of a woman's compact (the gadget women use for the hourly powdering of noses), and decorated not unlike it is the compact story of cancer, subtitled "Some Cancer Facts for Women." Put out by the New York City Cancer Committee, it tells in a bright conversational style the known facts about cancer and "is aimed to quiet some of your fears, answer some of your questions, and arm you with several life-saving tips."

Accompanying the "compact" are a number of leaflets about cancer of the various organs, ten cancer I.Q. questions, and a listing of the most common wrong information about cancer.

#### CITIZEN INTEREST IN THE HEALTH DEPARTMENT

The finance committee of the Pittsfield (Mass.) City Council has recommended that the city Health Commissioner's salary be increased from \$4,000 to \$6,000. In a weekly signed column in the *Berkshire Eagle*, the Secretary of the Pittsfield Taxpayers' Association

uses this as the starting point for citizen education in several matters. He analyzes the suggested new salary in relation to other city department heads; it is more than that of any other department head except the Superintendent of Schools, one-third more than the salary of the Public Works Commissioner, one-half more than the Mayor, and 60 per cent more than the Welfare Commissioner. In a further analysis of the five Massachusetts cities with medically trained public health officers, Mr. Ahern finds that Pittsfield's Health Officer is at no disadvantage in salary.

Then Mr. Ahern analyzes the work of the Health Department, pointing out the steady decline in the city's death rate and in the incidence of the common communicable diseases. He recognizes that health ranks with schools and public works in vital public services. But—and this is the warning that should be noted by public health workers in their quite proper current demands for higher salaries—Mr. Ahern in mentioning the Health Department's apparent lethargy in certain matters of building codes, water pollution, and others, says "Communities will pay off when health officers lift their eyes to new fields to conquer, visible to the average man even now." A neat job of objective analysis.

#### A COMMUNITY MEETS ITS OWN NEEDS

Credit Lines is indebted to the Berkshire District Health Officer, Dr. Charles E. Gill of Pittsfield, Mass., for copies of the *G. E. Pittsfield Apparatus Works News*. These tell the story of how employees of the local General Electric plant raised enough money for three iron lungs plus \$6,000 for the local chapter of the National Foundation for Infantile Paralysis.

It all began with five polio cases, one fatal, one paralyzed, and three recovered, in one local Boy Scout camp in July. On August 9, the *News* outlined the campaign plan by which it was

hoped each General Electric employee would contribute at least \$1. The goal was three iron lungs, cost \$4,800. On August 23 the *News* announced a total of nearly \$11,000 in gifts.

#### PUBLIC HEALTH EDUCATION IN INDIANA

Indiana's *Monthly Bulletin* of July, 1946, uses a series of simple but effective charts to educate Hoosiers in the need for extending their health services. The figures point out, for example, that the death rates from four communicable childhood diseases and from typhoid fever as well as from all enteric causes, though in each case lower than the average for the United States, are higher than in any of the four neighboring states of Illinois, Michigan, Ohio, and Wisconsin. In no one of the measures of community health—cancer mortality, tuberculosis mortality, maternal or infant mortality—is Indiana at the top of the list of these five states. In per capita appropriation for health services Indiana is fifth from the bottom of the 48 states, in expenditures for local health units it is at the bottom of the five states, with less than one-third the expenditures of its nearest competitor, Illinois. As to state expenditures, it is lower than any of the five, except Ohio.

The moral: "How badly do we need full-time local health departments! They would cost so much less than disease. . . . Adequate public health administration for a given community will cost annually about one dollar per capita, the cost of two cocktails, or a fairly good tie. . . . How ridiculously small that seems."

#### BLUEPRINT FOR REHABILITATION CENTERS

The fourth of the publications of the Baruch Committee on Physical Medicine is a *Report on a Community Rehabilitation Service and Center*. This booklet is the final report of the Subcommittee on Civilian Rehabilitation

Centers. The foreword states that it has been prepared "in the hope that it will be of aid to communities, medical schools, civic groups, or any organization interested in establishing community rehabilitation centers."

The plans have been derived from the experience in the armed forces. They represent a basic guide and must be modified to meet specific needs of the individual community. The report has been prepared to meet requests for information on rehabilitation centers that have come from all over the world.

Available from The Baruch Committee on Physical Medicine, 597 Madison Avenue, New York 22.

#### THE RIGHT—SO RIGHT—ANSWER!

A mayor of a midwestern town recently was visited by a delegation with the request that he reopen a red-light district, closed during the war. He told them: "Gentlemen, I'll reopen that district if you permit your own daughters to staff the houses. Somebody's daughters would have to be placed there. I don't want the personnel recruitment on my conscience." The delegation left in silence. "The Prostitution Racket Is Back" by Albert Deutsch in *The American Mercury*, September, 1946.

The New York State Committee on Tuberculosis and Public Health sends out this perfect answer to its local associations, suggesting that it be used in bulletins and news letters, in talks and interviews.

#### DULUTH'S ANNUAL REPORT

The 1945 report of the Duluth, Minn., Health Department is its 49th. It takes justifiable pride in a perfect maternal mortality score—no deaths from diseases or complications of pregnancy and child bearing. "What has been done before may be done again!" says the report.

It also takes pride in the history of its diphtheria prevention program.

Twenty-five years ago in 1921 there were 204 cases and 11 deaths. In 1933 began a ten year period with neither resident cases nor deaths (four non-resident cases and one death during the period). In 1943, following the trend in other areas of the country, four cases appeared, in 1944, 22 and in 1945, 18. However, only two deaths occurred in these three years. The report does an excellent job of interpretation of this trend, of the four to six month period required for diphtheria injections to attain a satisfactory level of immunization, and of the timing factors in planning a city-wide immunization campaign.

The margin illustrations in the report are taken from the Association's pamphlet "What to Tell the Public About Health."

#### COMMUNITY EDUCATION IN COMMUNITY NEEDS

The American Hospital Association met in Philadelphia in October. This, together with the passage of the Federal Hospital Construction Act, inspired the Chamber of Commerce to devote a large part of the October *Philadelphia* to a discussion of the hospital problem in that city, with particular emphasis upon the Blue Cross plan.

With appropriate historical notes (Ben Franklin was the first clerk of the first Board of Hospital Managers in 1751), and with excellent photographs, it tells the story of the city's existing hospitals, sources of their income, their contributions to medical science, such as Bryn Mawr Hospital's part in developing the dried blood plasma methods, and finally the story of Blue Cross—its growth, its effect upon the stability of hospitals, and the degree of its acceptance by the public and the medical profession. This has been called "a unique effort to bring to the citizens of our community an awareness of the complexities which

must be understood by everyone if Philadelphia's needs are to be met."

#### FIFTY YEARS OF HOFFMAN-LA ROCHE

Hoffman-LaRoche celebrates its 50th birthday, and the 10th birthday of the *Roche Review* (Roche Park, Nutley 10, N. J.), with a Tenth Anniversary issue of the Review. It summarizes the progress in medicine, and in endocrinology during the years 1936-1946, of the progress at Roche itself during these years, a brief history of the firm including pictures of the Basle, Switzerland, plant where 50th anniversary festivities were recently held, as well as past and present pictures of Roche Park in New Jersey. An interesting report without blatant ballyhoo.

#### JOINT WATER SUPPLY SYSTEM FOR TWO MICHIGAN CITIES

Evidence piles up of coöperation among communities in providing citizen services. The latest comes out of Michigan where the cities of Saginaw and Midland, with populations of 81,000 and 10,000 respectively, have entered into an agreement to build and operate jointly a water supply system, the annual operating costs to be allocated on the basis of the amount of water used. Its management will be vested in a six member board consisting of the city manager and two other representatives of each city.

#### SUMMER INTERNSHIPS FOR MEDICAL STUDENTS IN HEALTH DEPART- MENTS IN MISSISSIPPI

*Summer Internships in a Public Health Program for Medical Students*, describes a demonstration program arranged by the Mississippi State Board of Health in the summer of 1946. Twelve sophomore and junior medical students from four coöperating medical schools were selected on the basis of references and their expressed interest in public health. For the period of

their internships they were given subsistence allowances. A one week introductory training course was conducted at the central offices of the State Board of Health in Jackson by Felix J. Underwood, M.D., and his staff. The students were then assigned for two months to county health departments that offered a suitable program. Here they not only observed the operation of the county health units but also participated actively in the work of the departments, principally in the various clinics.

Comments of the students and the participating health officers quoted in the booklet indicate that this project, which was planned "to determine the value of two or more months' actual experience in a state-wide public health program," was a successful experiment. Plans are already in progress to repeat and to expand the program of summer internships in Mississippi in 1947. Applications for participation are being received by Felix J. Underwood, M.D., Executive Officer, Mississippi State Board of Health, Jackson 13, Miss.

For the benefit of those who are interested in field training it would be interesting to know how the schedules were arranged as, for instance, the amount of time spent with various members of the health department staff, number of clinic sessions attended, and the methods of introducing the students to community programs.

#### POLLUTION ABATEMENT

The abatement of the pollution of streams and inland waterways is the chief topic of concern in the October, 1946, issue of *Sewage Works Engineering*. In anticipation of the introduction of a new bill in the 80th Congress to replace HR 6024, "the compromise bill, which failed to compromise"—information relative to current state pollution efforts is presented.

"National Round-Up of Pollution Abatement Program" is one of the articles

appearing in the issue mentioned above. It summarizes the replies of 35 state sanitary engineers to questions concerning: (1) official pollution abatement units and their programs; (2) new pollution legislation; (3) the attitude of industry toward pollution abatement; (4) state participation in joint pollution abatement activities, and (5) present sewage treatment works construction plans. The text of the replies of 31 of the state engineers is also included.

#### INTRODUCING THE "COMMENTATOR"

With Vol. 1, No. 1 of the *Health Commentator* in October, 1946, Washington was added to the list of states whose health departments publish a monthly bulletin of news about state health activities. In the first issue Arthur L. Ringle, M.D., State Director of Health, outlines the purpose "to interpret new developments in public health and to make you better acquainted with the work of your local health department and the State Department of Health."

This issue also reports plans for the organization of a Bellingham City-Whatcom County full-time health department as the result of action by the city council and county commissioners. This area of more than 60,000 persons is currently served by two part-time health officers.

#### HOSPITAL COUNCIL

Credit Lines welcomes the new monthly *Bulletin of the Hospital Council of Greater New York* (370 Lexington Avenue, New York). Although the September, 1946, issue is Vol. 2, No. 1, it is actually a new bulletin, its only other issue being in 1944, after which it became a wartime casualty. This new first issue reviews the progress in the development of a master plan for hospital facilities in metropolitan New York and gives a brief summary of the Hospital Construction Act in non-technical

language. John B. Pastore, M.D., is Executive Director of the Council, Haven Emerson, M.D., is Chairman of its Planning Committee and serves on the editorial board of the *Bulletin*.

#### HOME RULE IN HEALTH

Under this title the October *Georgia's Health* (12 Capitol Square, Atlanta 3) reports that eight multiple county health units have been organized since January 1, 1946, thus providing local health service to 400,000 persons. More than two-thirds of the state's population is now protected by full-time local health department service. Continues the report "Personnel shortages are more acute now than they have ever been. Since personnel is scarce, effective distribution of that remaining has been a paramount objective."

#### THE EVALUATION SCHEDULE IN OTHER FIELDS

A recent correspondent proposes that the *Evaluation Schedule* might be used as a pattern for evaluation in the field of public welfare. If among our readers there are uses of the *Evaluation Schedule* in other fields outside of public health, the editors would be pleased to know about them.

#### URUGUAY'S FIRST HEALTH CENTER

In March, 1946, Uruguay's first health center was inaugurated in Fray Bentos, a municipality of about 18,000 persons. Fray Bentos is a meat packing center and has an excellent fresh water port on the Uruguay River. The story of this health center, a coöperative venture with the Institute of Inter-American Affairs, the community organization preceding it, its activities and staff, is told in the September *News Letter* of the Health and Sanitation Division of the Institute of Inter-American Affairs (Washington 25, D. C.). Among its present unusual features is a six month course in nursing

for local student nurses, in order to meet the nursing shortage.

#### IMMUNIZATION IN AURORA, ILLINOIS

The *Illinois Health Messenger* (Springfield, Ill.) of August 1, 1946, reports on the diphtheria and smallpox immunization program in the Aurora public schools. The chief elements in the protection of nearly 90 per cent of school children are the coöperation of medical, public health, and school agencies, and the regularity with which the program is carried on each year. In this program only those unable to pay are given free service; the physicians participating in the program are reimbursed from the \$1.50 charge per child, for which a complete series of inoculations against diphtheria and smallpox are provided.

#### TIPS ON THE USE OF CARBON

##### TETRACHLORIDE

"How to Use Carbon Tetrachloride Safely," is further inscribed, "Tips to the Foreman." Those titles of the leaflet prepared by the Safety Research Institute, Inc., New York City, describe the contents of the four page folder adequately. If you work with carbon tetrachloride you probably would appreciate seeing a copy of these Tips.

#### USE OF RODENTICIDE 1080

Here is a timely leaflet published by the Texas Water and Sanitation Research Foundation, Austin, Tex., that should answer those questions about the new rodenticide "1080." "Instructions for Use of Compound 1080 as a Rodent Poison," tells briefly how to use the poison, limitations in its use, precautions in handling, and what to do when those inevitable accidents result in the wrong animal (man) getting the poison.

#### CANCER EDUCATION IN SCHOOLS

The American Cancer Society (350

Fifth Ave., New York 1) has a set of cancer education pamphlets for schools known as School Set "A." It includes instructions for building a cancer control school program, a bibliography, and much material to stir the interest of youth. *Changing of the Guard*, for example, starting with the historical guards at Buckingham Palace, inspires the youngster to guard his parents with knowledge about cancer; *Health Heroes* is a moving short biography of Marie Curie; *Cancer: A Challenge to Youth* is an attractive classroom guide to the study of cancer; *Youth Looks at Cancer* is a Textbook for Colleges and High Schools. These and others included in the packet make for a well balanced study project which introduces young people early to one of the present-day most serious and most puzzling medical problems.

#### CANCER EDUCATION IN LABOR UNIONS

The New York City Cancer Committee last spring began a vigorous campaign of cancer education in labor unions. By getting the coöperation of the Central Trades and Labor Councils of both national unions, and the Joint Boards or Councils of local unions in a particular union it has been able to place its educational material in many union headquarters and meetings and to plan for physicians' lectures on cancer to union groups. This is a channel for health education that other groups could use with profit.

#### WORTH ACQUIRING

With the publication of *Cancer Facts* the Health and Welfare Division of the Metropolitan Life Insurance Company ends its first year of an extensive educational program on cancer. *Cancer Facts* is an exhibit first displayed at the July, 1946, meeting of the American Medical Association. It consists of 10 charts, 21 x 30 inches, in two colors. Copies are available for teaching and

exhibits (Health and Welfare Division, Metropolitan Life Insurance Company, 1 Madison Avenue, New York 10).

This exhibit reproduced in booklet form, is called "Cancer Facts." The supply of the booklet is limited to reference use or for study or promotional programs.

#### OKLAHOMA'S MERIT SYSTEM ANNUAL REPORT

The 1945-1946 annual report of the Oklahoma Merit System of Personnel Administration represents a departure from the usual method of reporting activities. Designed to attract candidates and potential workers for public health, welfare and employment agencies, it presents in pictorial and graphic form, through cartoons and the use of short, terse, factual statements, the steps through which an applicant goes in order to secure a position. It presents the principles of the merit system of personnel administration, its history (on one page with two cartoons), the application and examination process, and the various benefits which are a part of government service. The veterans' section is particularly well done. The preference given for veterans is presented clearly and concisely, positions for veterans in public welfare are listed, and a one-line war biography is given for 49 veterans who have returned to their work.

Major vocations are listed under a picture of the home office of each agency, and "common agency jobs" are listed separately. The work history under the merit system of one employee is carried under her photograph, and three outstanding examination candidate are pictured.

The Merit System Council has two pages listing major actions taken during the year with regard to personnel.

For the person interested in the classification of activities carried on by the Council, the section on examinations, activities affecting personnel, including certifications, will be of interest. The unit demonstrates its interest in self-analysis by the studies being carried on relating to item analysis of examinations, analyses of oral examinations, tenure of employees, non-appearance of applicants, personnel status and costs.

This attractive pamphlet is timely in view of the expanding post-war health programs and the need for public workers.

#### CORRECTION

The correct address for Community Service Society as mentioned in November Credit Lines (p. 1328) is 105 East 22nd, New York 10, N. Y. The correct price of the latest revision of its Guide for Public Health Nurses: Tuberculosis is 10¢ plus postage.

## BOOKS AND REPORTS

*All reviews are prepared on invitation. Unsolicited reviews cannot be accepted. All books reviewed in these columns may be purchased through the Book Service.*

**The American Hospital**—By E. H. L. Corwin, Ph.D. New York: The Commonwealth Fund, 1946. 226 pp. Price, \$1.50.

Those engaged in the field of hospital administration, as well as the public at large, have been limited in the availability of informative material on this subject. As a matter of fact, but two or three books of significant value have been published during the past quarter of a century which could justify being considered as a text and reference at the disposal of those concerned with hospital care. Anything, therefore, which contributes to the literature in this field has received a most hearty welcome.

Dr. Corwin has assembled, in readable form, some interesting and historic data on the development of the hospital structure in the United States, the changes which have taken place in a comparatively short span of time, and has emphasized the important reasons which have been responsible for the increasing popularity and the rapid growth of our hospitals. Chapters are devoted to staff organization, the out-patient department, the hospital as a teaching institution, and particularly appropriate space is given to a review of the past and the prospects of the future. In connection with the latter phase, the place of convalescence, chronic care, domiciliary treatment of the sick, as well as an estimate of post-war hospital needs, receive fitting recognition.

This book will be of great interest and value to all who are interested in the whole subject of hospital service for the American people and who may desire, in reasonable digest form, facts and figures dealing with this important phase of essential community service.

CHARLES F. WILINSKY

**Cities Are Abnormal**—Edited by Elmer T. Peterson. Norman, Okla.: University of Oklahoma Press, 1946. 263 pp. Price, \$3.00.

This book, a symposium by a dozen authors, many of them well known, presents a case for "decentralization" of cities. One chapter, by a physician, is on "biological truths and public health." In spite of many undocumented assertions or scientific half-truths in this and other chapters, there is much relevant and valuable material in the volume on the desirability of having the industrial worker tied to the soil. Many aspects—including "the atomic threat"—are touched on, with perhaps too little emphasis on blighted areas and the slums. The tenor of the book is unduly optimistic. It would appear that the evils will be righted "under the auspices of individual initiative, encouraged by such a governmental policy as is likely to create the appropriate climate and ecology for decentralization."

ROLLO H. BRITTEN

**Essentials of Pediatrics**—By Phillip C. Jeans, A.B., M.D., Winifred Rand, A.B., R.N., and Florence G. Blake, R.N., M.A. (4th ed.) Philadelphia: Lippincott, 1946. 627 pp. Price, \$3.50.

Here is an excellent book for schools of nursing where public health nursing is being incorporated into the basic curriculum. The relation of the child to the family and what constitutes complete nursing care is stressed repeatedly. "Situations for Further Study" encourage the nurse to outline instructions for the mother giving care in the home. Chapter V—"The Child Health Conference as a Means of Guidance" is recommended for the public health nurse as well as the nurse in the out-patient de-



partment of the hospital for whom it was written.

The contents have been rearranged into five units as suggested in the curriculum for schools of nursing prepared by the National League of Nursing Education. The description of the growth and development of the normal child precedes the discussion of the specific diseases of children and the nursing care recommended for each.

The many illustrations and arrangement of text material into double columns with appropriate headings make for easy reading. A glossary and up-to-date bibliography enhance the value of the book for the undergraduate and graduate nurse. FLORENCE MANLEY

**The Forces That Shape Our Future**—By Clyde Eagleton. *New York: New York University Press, 1945.* 200 pp. Price, \$3.25.

Things move so fast in the international field that it is unusual to find a book published in 1945 which is still valuable in 1947. Professor Eagleton's James Stokes Lecture is an exception to the general rule, in part perhaps because the Commission for the Study of the Organization of Peace (with which Professor Eagleton is connected) is playing so influential a part in shaping national policy. In any case, this compact volume is well worth reading for those who want to face wisely the problems of the future.

The major thesis of Professor Eagleton's book is that the increasingly complex interrelationships of the modern world create an essential and vital antithesis between "rugged individualism" and the necessity for coöperative effort—both on the national and the international stage. The solution can only be found by dispassionate thinking and by the working out of effective compromises which will save the major values of both viewpoints. "The unbearable pressure of modern war" makes the discovery of

such solution most immediate; and Professor Eagleton dedicates his book "to my son, who also must fight because of mistakes of his elders." He outlines clearly the essentials of an adequate program of international coördination, and the sacrifices we must be prepared to make to render such an organization effective. He says in his final chapter, "the unknown wilds of this continent did not daunt us as we pushed its frontier back; the risks of huge business undertakings and organization have never caused us to hesitate; we are pioneers today in great new fields of science and technical development. The blood of our fathers is still in us, and it surges forward to face the new opportunities that lie ahead."

C.-E. A. WINSLOW

**Diabetic Care in Pictures**—By Helen Rosenthal, B.S., Frances Stern, M.A., and Joseph Rosenthal, M.D. *Philadelphia: Lippincott, 1946.* 150 pp., 137 illus., 4 in color. Price, \$2.00.

If every diabetic could own this book, the time normally spent by physicians, nurses, and dietitians in teaching diabetics how to take care of themselves would be greatly reduced. The patients would have constant access to simple but accurate information to guide them in everyday living with others and with their disease. Following the physician's diet prescription would be fun, for diabetics can so easily have wide choice of food and still stay within their prescription. Every step in diet control, use of insulin, follow-up checks on urine, and in the care of their bodies is profusely illustrated, as well as simply described. The reviewer regrets that, in the table showing suggested food allowances, niacin allowance is given in milligrams needed per day, while in the pages showing relative values of foods as sources of niacin, the standard of comparison is expressed in micrograms.

MARTHA KOEHNE

**The Venereal Diseases—A Manual for Practitioners and Students—** By James Marshall. New York: Macmillan, 1946. 348 pp. Price, \$4.50.

This book is intended as a manual or textbook for general practitioners and medical students. It is written by an English physician for British medical consumption and this must be borne in mind by the American reader.

The control of the venereal diseases through treatment has undergone remarkable change and particularly in the interim between the time the book was published in 1944 and the present. The use of sulfonamides is stressed in the treatment of gonorrhea rather than penicillin, which is mentioned briefly in the discussion. Rather elaborate treatment schedules with arsenic and bismuth are recommended in the treatment of syphilis with no discussion of the rôle of penicillin.

There are excellent diagrams and pictures throughout the text and these contribute markedly to the readability of the book. An excellent chapter is included on practical instructions as to procedures and technic in office practice.

There is little of the philosophy of the public health control of the venereal diseases and the rôle of the private practitioners in the control program.

There are several points of view expressed by the author which may be debatable, but differences can be resolved by an understanding of some fundamental differences of approach to venereal disease control in Britain and in the U. S. A.

This book should be a valuable addition to the well-rounded library of the American venereologist. J. R. HELLER, JR.

**New Worlds in Medicine—Edited by Harold Ward.** New York: McBride, 1946. 689 pp. Price, \$5.00.

The lay editor often discovers gems

of medical writing which never find their way into technical journals. Editor Ward has assembled a sparkling collection of such gems in this anthology. It is a worthy companion to his recent anthology, *New Worlds in Science*. Written for the layman, these choice articles have been selected with remarkable discrimination so that technical material is presented in everyday language.

The editor has received inspiration from lectures to the laity published by the New York Academy of Medicine, but he has also made a fruitful search of many books and periodicals not usually seen in physicians' libraries. Excellent continuity has been maintained partly by choice of subjects and partly by the editor's introductory remarks preceding each article. By these means he has been able to display the progress in a given field within its proper historical setting. He has also achieved a balance between technical and social progress with just the right emphasis on preventive medicine. Trends in social medicine appear inevitably attached to progress in technical medicine while technical material is presented with simplicity and interest, but without melodrama. At the conclusion of each subject the reader is left with the feeling that he has learned much about a subject he thought he knew and about which more should have been written.

All of the contributors are eminent in their special fields, yet they write with a simplicity that comes from complete familiarity with the subject. For the sake of the lay reader it is unfortunate that the biographical sketches of contributors are not stronger, and that they are not inserted as a preface to each article. To point out the most outstanding contributors in this anthology would be to detract from an appreciation of all the gems in a total setting.

This is a book that will bring much satisfaction to the health officer and his

staff. For the health educator it will be a stimulating source of reference and of inspiration.

CHARLES E. SHEPARD

*Free Medical Care—Compiled by Clarence A. Peters. The Reference Shelf, Vol. 19, No. 3. New York: H. W. Wilson Company, 1946. 378 pp. Price, \$1.25.*

This is a compilation of material on national health insurance. There is a fairly good selection of pro and con opinions with scrupulous adherence to the principle of giving both sides equal space. The title of the volume is most unfortunate since the point at issue is not "free medical care" but prepaid medical care. This confusion is evident in the volume itself and reflects the popular misunderstanding engendered by the use of emotionally charged words like "socialized medicine."

While the book is of little value to the serious student of medical care problems, it may be useful as an introduction to the subject. Its greatest use will be the one for which it is evidently intended, as a convenient reference and debating manual. MILTON TERRIS

*Water Bacteriology—By Prescott, Winslow, and McCrady. New York: Wiley, 1946. 368 pp. Price, \$3.50.*

Water bacteriologists welcome the revision of this reference book, which for

forty years has been a necessary part of the equipment of the water laboratory. During the fifteen years since the appearance of the previous edition important advances have been made in bacteriologic procedures in sanitary water analysis. While *Standard Methods for the Examination of Water and Sewage* gives the laboratory techniques, it is necessary to interpret the results, and this volume gives the basis for the interpretations.

The revision has been made by the junior author with commendable results. The entire book has been rewritten. The most notable changes are those in connection with the coliform organisms. These chapters are excellently written and all-inclusive. Although some of the methods described are only of local significance, they are and should be included in an adequate discussion.

At first the reviewer wondered at the continued inclusion of tabulated data carried over from earlier editions, but more careful study convinced him that these tables are not only just as good illustrative material as when first published, but also that many of them have never been duplicated. Where new material is available, it has been substituted.

The water bacteriologist and the sanitary engineer again have available an authoritative treatise.

JOHN F. NORTON

## A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

*Hygiene and Sanitation in Company Towns—Have you wondered why so little is written about those radical departures from industrial practice, the miners' welfare and medical care funds? Well, here are some illumi-*

*nating papers you can't afford to miss if you have any interest whatever over and above your own two-by-four job. Incidentally, you'll get some inkling of the reasons the discussion may have been soft-pedaled.*

BOONE, J. T. New Horizons in Industrial Health and Welfare (and two related papers). J.A.M.A. 132, 13:755 (Nov. 30), 1946

**This Will Leave You Chastened**—Mental hygiene seems to be on every health worker's tongue these days. Before you go off the deep end, too, you might read this discussion of psychoneuroses, psychoses, and psychopathic personalities, just to see how shallow you'll find the water when you dive in. Does a psychoneurosis ever develop into a psychosis? This is only one of a dozen unanswered questions you'll find here.

BOWMAN, K. M. Modern Concept of the Neuroses. J.A.M.A. 132, 10:555 (Nov. 9), 1946.

**Where Cruelty Was a Fine Art**—"The fruits of experience as prisoners of war in Japanese hands, though abundant, were exceedingly bitter." So begins a stomach-turning account of conditions in Java and Siam prisoners' hospitals. This paper would make salutary reading for those in danger of becoming maudlin over the news accounts of the little people's idolatry of McArthur.

DUNLOP, E. E. Medical Experiences in Japanese Captivity. Brit. M. J. 4474:482 (Oct. 5), 1946.

**Good News about Mumps**—Pathogenicity of mumps virus decreases on continued passage in the egg, but the antigenicity appears to be maintained—for monkeys, and possibly, for man.

ENDERS, J. F., *et al.* Attenuation of Virulence with Retention of Antigenicity of Mumps Virus after Passage in the Embryonated Egg. J. Immunol. 54, 3:283 (Nov.), 1946.

**Trends of Sickness Absenteeism**—Sickness and non-industrial accident rates (lasting 8 days or longer) have risen regularly, culminating—in 1945—in male and female rates that have not been equalled. Because of notable in-

creases in nonrespiratory-nondigestive diseases, the frequencies of rheumatic, nervous, circulatory and genitourinary diseases are shown for each sex. There's a lot more.

GATAFER, W. M. Sickness Absenteeism among Male and Female Industrial Workers during 1945, With a Note on the Respiratory Epidemic of 1945-46. Pub. Health Rep. 61, 45:1620 (Nov. 8), 1946.

**Not a Substitute for Proved Treatment**—More good—though guarded—news about streptomycin and tuberculosis. It suppresses rather than eradicates TB, but results are encouraging. Large doses are required over a 2 to 4 month period, so treatment should not be started unless a sufficient supply is in sight, and patients who are doing all right without it shouldn't get it.

HINSHAW, H. C., *et al.* Treatment of Tuberculosis with Streptomycin. J.A.M.A. 132, 13:778 (Nov. 30), 1946.

**Fluorine Applied to Children's Teeth**—During the third year of this study, the permanent teeth attacked were 22 per cent less for the treated than the untreated. This difference is substantially less than for the first two years of this Minnesota research.

KNUTSON, J. W., and ARMSTRONG, W. D. The Effect of Topically Applied Sodium Fluoride on Dental Caries Experience. Pub. Health Rep. 61, 47:1683 (Nov. 22), 1946.

**A Plan for Minneapolis**—As with most problems, the nearer tuberculosis control comes to being established on a scientific basis, the more clear-cut become the differences of expert opinion. Here you will find a forcefully expressed viewpoint at variance with other workers in the field. It will do you good to read this paper with an open mind, whether or not you are immediately concerned with tuberculosis.

MYERS, J. A. The Establishment and Use of Fundamental Procedures in Tuberculosis Control. Pub. Health Rep. 61, 41:1563 (Nov. 1), 1946.

**Good Advice for the Deafened—**

If you want a hearing aid consult an otologist first, try a number of makes at a Hearing Aid Clinic, try the aid in both quiet and noisy places, buy the instrument you like best, and use it full time, know when to turn it in for a new model.

NASH, C. S. Artificial Aids to Hearing. *Am. J. Nurs.* 46, 11:763 (Nov.), 1946.

**Not To Be Missed—**

For the good of his own soul, everyone in public health should read this caustic dissertation on respiratory infections—colds, sore throats, grip, virus pneumonias, and the influenzas. Essentially the discussion boils down to this: nothing we teach others to use or use ourselves does good in curing virus infections; advertised cold cures are not worth the powder to blow them you-know-where; and (aside from teaching people the worthlessness of most of the so-called treatments they have come to believe are good for them) there is precious little to be done at present about viral infections, except to go to bed. Influenza A and B are, of course, other matters.

REIMAN, H. A. Viral Infections of Respiratory Tract. *J.A.M.A.* 132, 9:487 (Nov. 2), 1946.

**Profound Words Department—**

"Until recently what men thought about cancer depended on how ingenious they were, they had not enough facts to constrain them. It has taken decades to trace the natural history of the disease and to uncover the complexities of its occurrence, but now it looms in sharp

outline. . . . This is well, for the problem has turned out to be larger than anyone knew."

ROUS, P. Concerning the Cancer Problem. *Am. Scientist* 34, 4:329 (July), 1946.

**It Works on American Rabbits,**

**Too—**Antireticular cytotoxic serum was prepared according to the technics evolved by the Russian researchers and its effects were tested upon experimentally produced fractures in rabbits. Much to your surprise, the stuff really did stimulate the healing process.

STRAUS, S., *et al.* Studies on Antireticular Cytotoxic Serum. *J. Immunol.* 54, 2:151 (Oct.), 1946.

**Respect for the Individual—**

"It is the increasing practice today among pediatricians who are mindful of all the developmental needs of infants to instruct mothers to nurse their own babies and to nurse them when they are hungry." That seems to be enough to tell you about this paper.

TRAINHAM, G., and MONTGOMERY, J. C. Self-Demand Feeding for Babies. *Am. J. Nurs.* 46, 11:767 (Nov.), 1946.

**Health Education and Medical**

**Care Needed—**Though Negro maternal mortality rates have been nearly halved in the last two decades, they are still two and a half times the death rate of white mothers. Why? Is it a matter of biologic inheritance, some essentially different obstetrical problem, or contrasting situations of economic and social heritage? You'll find answers here.

WILLIAMS, P. F. Maternal Welfare and the Negro. *J.A.M.A.* 132, 11:611 (Nov. 16), 1946.

## BOOKS RECEIVED

- THE HUMAN BODY.** By Clifford Lee Brownell and Jesse Feiring Williams. New York: American Book Co., 1946. 310 pp. Price, \$1.52.
- HYGIENE (4th Ed.).** By F. L. Meredith, M.D. Philadelphia: Blakiston, 1946. 838 pp. Price, \$4.00.
- IF YOU ASK MY ADVICE.** By Henry Pleasants, Jr., M.D. Boston: Bruce Humphries, 1946. 110 pp. Price, \$2.00.
- INFANT AND CHILD IN THE CULTURE OF TODAY.** Arnold Gesell, M.D., and Frances L. Ilg, M.D. New York: Harper, 1946. 399 pp. Price, \$4.00.
- LAMP BULLETIN.** Prepared by C. E. Weitz. Cleveland: General Electric (Engineering Div.), 1946. 76 pp. Price, \$4.00.
- LEPROSY (3d Ed.).** By Sir Leonard Rogers and Ernest Muir. Baltimore: Williams & Wilkins, 1946. 280 pp. Price, \$7.00.
- LYMPH (ANNALS, THE NEW YORK ACADEMY OF SCIENCES, Vol. XLVI, Art. 8, pp. 679-882).** By Philip D. McMaster, et al. New York: New York Academy of Sciences, 1946.
- MANUAL OF APPLIED NUTRITION (2nd Ed.).** Baltimore: Johns Hopkins Hospital Dietary Dept., 1946. 103 pp.
- MANUAL FOR SCHOOL AND INSTITUTIONAL LUNCH ROOMS (rev.).** Cleveland: Ohio Dietetic Assoc., 1946. 222 pp. Price, \$2.00. (\$1.85 for 3 or more.)
- MANUAL OF RECOMMENDED PRACTICE FOR SANITARY CONTROL OF THE SHELLFISH INDUSTRY.** (Public Health Bulletin No. 295.) The Surgeon General, USPHS. Washington: U. S. Gov. Ptg. Office, 1946. 44 pp.
- MEDICAL USES OF SOAP.** By Morris Fishbein, M.D. Philadelphia: Lippincott, 1946. 195 pp. Price, \$3.00.
- MICROBIOLOGY APPLIED TO NURSING (5th ed.).** By Jean Broadhurst, Ph.D., and Leila I. Given, R.N. Philadelphia: Lippincott, 1946. 569 pp. Price, \$3.50.
- MORTON'S MEMOIR.** By W. T. G. Morton. New York: Henry Schuman, 1946. 24 pp. Price, \$1.50.
- NOTES ON NURSING: WHAT IT IS, AND WHAT IT IS NOT (reprint).** By Florence Nightingale. Philadelphia: Lippincott, 1946. 79 pp. Price, \$1.25.
- NUTRITION AND DIET THERAPY (9th ed.).** By Fairfax T. Proudfit and Corinne Hogden Robinson. New York: Macmillan, 1946. 782 pp. Price, \$3.75.
- NUTRITION FOR YOUNG AND OLD.** Albany: New York State Joint Legislative Committee on Nutrition, 1946. 227 pp. Free from Senator Desmond, 94 Broadway, Newburgh, N. Y.
- NUTRITION IN PUBLIC HEALTH.** By Lucy H. Gillett. Philadelphia: Saunders, 1946. 303 pp. Price, \$2.75.
- PERSONAL POLICIES FOR PUBLIC HEALTH NURSING AGENCIES.** New York: National Organization for Public Health Nursing, 1946. 31 pp. Price, \$.75.
- PROBLEMS IN ABNORMAL BEHAVIOUR.** By Nathaniel Thornton. Philadelphia: Blakiston, 1946. 244 pp. Price, \$2.00.
- REPORT OF NEW YORK STATE JOINT LEGISLATIVE COMMITTEE ON INDUSTRIAL AND LABOR CONDITIONS.** Albany: Williams Press, 1946. 210 pp.
- RKG RHEOCARDIOGRAPHY.** By W. Holzer, et al. Vienna: Wilhelm Maudrich, 1946. 43 pp.
- TEACHING IN SCHOOLS OF NURSING.** By Loretta E. Heidgerken. Philadelphia: Lippincott, 1946. 478 pp. Price, \$4.00.
- THE TOXICITY AND POTENTIAL DANGERS OF METHYL BROMIDE WITH SPECIAL REFERENCE TO ITS USE IN THE CHEMICAL INDUSTRY, IN FIRE EXTINGUISHERS, AND IN FUMIGATION.** By W. F. von Oettingen, USPHS. Washington: Gov. Ptg. Office, 1946. 41 pp. Price, \$.15.
- TREATMENTS OF BRONCHIAL ASTHMA.** By Vincent J. Derbes, M.D., and Hugo Tristram Engelhardt, M.D. Philadelphia: Lippincott, 1946. 466 pp. Price, \$8.00.
- VICTORY OVER PAIN.** By Victor Robinson, M.D. New York: Henry Schuman, 1946. 338 pp. Price, \$3.50.
- WHAT TEACHERS SEE.** By George M. Wheatley, M.D. New York: Metropolitan Life Insurance Co., 1946. 33 pp.
- WHAT YOU SHOULD KNOW ABOUT TUBERCULOSIS.** By Charles E. Lyght, M.D. New York: National Tuberculosis Assoc., 1946. 30 pp.

# ASSOCIATION NEWS

## RESOLUTIONS

The following Resolutions were unanimously adopted by the Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 13, 1946.

### 1. MILTON JOSEPH ROSENAU

The Governing Council records with profound sorrow the passing of the President-Elect of the Association, Milton Joseph Rosenau, on April 9, 1946.

For nearly 40 years a member of the Association and a Charter Fellow, Dr. Rosenau served the Association with unique competence and distinction. He served as a member of the Governing Council from 1930 to 1936, as Chairman of the Epidemiology Section in 1939, and as a member of the Sedgwick Memorial Medal Committee from 1933 to 1937. In 1934 he was awarded the Sedgwick Memorial Medal for distinguished service in public health.

As Fellow, as Committee Member, as contributor to the *Journal*, Dr. Rosenau's preeminence as teacher, distinguished author, epidemiologist, and administrator was brought to the service of the Association and the public health ideals for which it exists. We shall long miss the inspiration of his wisdom and of his humanity.

RESOLVED that this resolution be spread upon the minutes, that copies be forwarded to Dr. Rosenau's family and to the University of North Carolina, and that it be read as the first item of business at the Opening General Session of the 74th Annual Meeting on Tuesday evening, November 12.

### 6. L. L. LUMSDEN

The Governing Council has learned with deep regret of the recent death of Dr. L. L. Lumsden.

Long a member of the Association and a pioneer in the field of public health,

he was an outstanding figure in epidemiological research and in the development of rural health administration.

During his active professional life extending over a period of more than 40 years, he contributed generously to sanitary science and to legislative enactment in the interest of public health. Through his knowledge and enthusiastic devotion to the fundamental principles of the work which he loved, he was a continuing inspiration to his associates and was responsible for many engaging in a public health career.

Those who knew him and received his kindly guidance will cherish his memory as long as they live.

RESOLVED that this resolution be spread upon the minutes, that copies be forwarded to Dr. Lumsden's family and to the United States Public Health Service, and that it be read at the Second General Session of the American Public Health Association held in Cleveland, Ohio, November 13, 1946.

### 7. IN MEMORIAM

RESOLVED that it is with a sense of irreparable loss that the American Public Health Association records, since its last Annual Meeting, the death of one hundred thirty-eight Fellows and members, the names of whom constitute a part of this resolution.

Louis M. Allyn, M.D., Mystic, Conn., Elected member 1921

Wade H. Anderson, M.D., Wilson, N. C., Elected member 1934

S. Josephine Baker, M.D., Belle Meade, N. J., Elected member 1915, Charter Fellow 1922

- Helen Baldwin, M.D., Canterbury, Conn., Elected member 1939
- Craig Barrow, M.D., Savannah, Ga., Elected member 1926
- Theodore D. Beckwith, Ph.D., Los Angeles, Calif., Elected member 1934
- Arthur S. Bedell, Delmar, N. Y., Elected member 1919
- George R. Bedinger, Plainfield, N. J., Elected member 1943
- H. S. Berman, M.D., Detroit, Mich., Elected member 1932
- Marie I. Bestul, R.N., Minneapolis, Minn., Elected member 1944
- Maharaj Mom Chow Bichitr, Bangkok, Siam, Elected member 1929
- Benjamin W. Black, M.D., Oakland, Calif., Elected member 1944
- Neal E. Blanton, Milwaukee, Ore., Elected member 1942
- George E. Bolling, Brockton, Mass., Elected member 1900, Charter Fellow 1923
- A. Edward Bostrom, M.D., Albany, Ore., Elected member 1938
- George M. B. Bradshaw, M.D., Panama, N. Y., Elected member 1936
- William W. Brooke, M.D., Bayonne, N. J., Elected member 1919, Fellow 1925
- Severance Burrage, D.P.H., Denver, Colo., Elected member 1897, Charter Fellow 1923
- Herbert C. Calvery, Ph.D., Washington, D. C., Elected member 1941
- Francis A. Campana, M.D., Union City, N. J., Elected member 1941
- Cloyd M. Chapman, Glen Cove, N. Y., Elected member 1941
- John A. Connelly, M.D., Trenton, N. J., Elected member 1942
- Ernestine Consigny, San Francisco, Calif., Elected member 1931
- Ben W. Creel, D.V.M., Mobile, Ala., Elected member 1940
- Percy de Stanley, M.D., Union, N. J., Elected member 1931
- Jaroslav Drbohlav, M.D., Prague, Czechoslovakia, Elected member 1946
- William Dreyfus, D.Sc., New York, N. Y., Elected member 1905
- Thomas J. Duffield, New York, N. Y., Elected member 1926, Fellow 1935
- C. N. Eisaman, M.D., Pittsburgh, Pa., Elected member 1940
- William J. Ellis, Ph.D., Trenton, N. J., Elected member 1928
- Harry M. Eudowe, New Haven, Conn., Elected member 1938
- Robert C. Farrier, M.D., E. St. Louis, Ill., Elected member 1929, Fellow 1942
- John E. Floyd, Asheville, N. C., Elected member 1940
- Louis J. Frank, Woodmere, N. Y., Elected member 1924
- Elva E. Gore, Springfield, Ill., Elected member 1930
- Kathryne Gabriel, R.N., Deposit, N. Y., Elected member 1924
- Leroy U. Gardner, M.D., Saranac Lake, N. Y., Elected member 1931, Fellow 1940
- Charlotte S. Greenhood, D.D.S., San Francisco, Calif., Elected member 1945
- John Grill, M.D., Milwaukee, Wis., Elected member 1935
- Don W. Gudakunst, M.D., Westport, Conn., Elected member 1921, Fellow 1927
- Blanche M. Haines, M.D., Three Rivers, Mich., Elected member 1920, Fellow 1928
- Nell P. Hall, Champaign, Ill., Elected member 1931
- Edward E. Hamer, M.D., Carson City, Nev., Elected member 1944
- John J. Heagerty, M.D., Ottawa, Ont., Elected member 1937
- Jane I. Hershey, Ph.D., St. Louis, Mo., Elected member 1941
- Dorothy F. Holland, Ph.D., Bethesda, Md., Elected member 1919, Fellow 1928
- Benjamin E. Holsendorf, Ph.D., Staten Island, N. Y., Elected member 1944
- Arthur W. Hopper, M.D., Washington, Pa., Elected member 1939
- Charles D. Howard, Concord, N. H., Elected member 1913, Charter Fellow 1922
- William H. Howell, M.D., Baltimore, Md., Elected member 1919
- Edward G. Huber, M.D., Waban, Mass., Elected member 1924, Fellow 1928
- P. Conner Hulse, D.D.S., Palmyra, N. J., Elected member 1937
- Joseph H. Humphrey, M.D., St. Louis, Mo., Elected member 1925
- A. C. Hunter, Ph.D., Washington, D. C., Elected member 1919, Fellow 1930
- L. W. Hutchins, New York, N. Y., Elected member 1942
- J. Frederick Jackson, Hamden, Conn., Elected member 1914, Charter Fellow 1923
- Nehemiah Janko, M.D., New York, N. Y., Elected member 1937
- Fred H. Jennings, Watertown, N. Y., Elected member 1908
- Hiram A. Jones, Ph.D., Albany, N. Y., Elected member 1945
- Harry L. Kadet, Brooklyn, N. Y., Elected member 1944
- Forrest A. Kelley, M.D., Winfield, Kans., Elected member 1938
- Thomas Kelly, V.M.D., Philadelphia, Pa., Elected member 1929
- Walter Kleberg, M.D., Galveston, Tex., Elected member 1930



- Lt. Peter J. Knaus, Sn.C., APO, New York, N. Y., Elected member 1943
- Marie E. Kopp, Ph.D., New York, N. Y., Elected member 1938
- Pauline E. Kuehler, Whiting, Ind., Elected member 1942
- Waller S. Leathers, M.D., Nashville, Tenn., Elected member 1910, Charter Fellow 1922
- William Litterer, M.D., Nashville, Tenn., Elected member 1926, Fellow 1934
- Major William H. Lloyd, Mt. Victoria, Md., Elected member 1919
- D. B. Lowe, M.D., Akron, Ohio, Elected member 1915, Charter Fellow 1922
- Burton Lowther, Denver, Colo., Elected member 1935
- Letitia E. Lynch, Merced, Calif., Elected member 1932
- Elin MacDougall, Bridgeport, Conn., Elected member 1944
- Ward J. MacNeal, M.D., New York, N. Y., Elected member 1920
- Frank L. McGahey, M.D., Grenada, Miss., Elected member 1943
- Bernard T. McGhie, M.D., Toronto, Ont., Elected member 1936
- J. J. McGrath, Salem, Mass., Elected member 1917, Charter Fellow 1922
- Thomas W. G. McKay, M.D., Oshawa, Ont., Elected member 1942
- Thomas T. McKinney, M.D., Denver, Colo., Elected member 1932
- William R. Martin, M.D., Charlotte Court House, Va., Elected member 1943
- Mrs. C. Mayfield, New Orleans, La., Elected member 1925, Fellow 1941
- Fred M. Meader, M.D., Kalamazoo, Mich., Elected member 1912, Charter Fellow 1922
- Sumner M. Miller, M.D., Peoria, Ill., Elected member 1935, Fellow 1942
- Frederick B. Miner, M.D., Flint, Mich., Elected member 1940
- Gordon B. Moffat, M.D., Kalamazoo, Mich., Elected member 1931
- Jesus E. Monjaras, M.D., Mexico City, Mex., Elected member 1891, Charter Fellow 1923 and Honorary Fellow 1935
- Jose D. Moral, M.D., Guayaquil, Ecuador, Elected member 1926
- William R. Munson, M.D., Westport, Conn., Elected member 1944
- Arthur L. Murray, M.D., Washington, D. C., Elected member 1920
- Horace Newhart, M.D., Minneapolis, Minn., Elected member 1930
- N. Estes Nichols, M.D., Portland, Me., Elected member 1911
- Walter H. Oglesby, Clovis, N. M., Elected member 1945
- Fridgeir Olason, M.D., Boston, Mass., Elected member 1943
- J. Earle Parker, Waban, Mass., Elected member 1944
- Francis D. Patterson, M.D., Philadelphia, Pa., Elected member 1913, Charter Fellow 1922
- Inez Patterson, New York, N. Y., Elected member 1944
- J. Allan Patton, M.D., Newark, N. J., Elected member 1920
- William C. Pauli, M.D., Cincinnati, Ohio, Elected member 1930
- Eugene C. Peck, M.D., Leonardtown, Md., Elected member 1932
- Robert E. Perdue, M.D., Norwalk, Conn., Elected member 1940
- Rosemary Phillips, R.N., St. Louis, Mo., Elected member 1939
- Claude C. Pierce, M.D., New York, N. Y., Elected member 1942
- Alva S. Pinto, M.D., Omaha, Nebr., Elected member 1928
- Barbara S. Quin, New York, N. Y., Elected member 1929
- Mazyck P. Ravenel, M.D., Columbia, Mo., Elected member 1897, Charter Fellow 1922
- Maurice H. Rees, M.D., Denver, Colo., Elected member 1938
- Milton J. Rosenau, M.D., Chapel Hill, N. C., Elected member 1909, Charter Fellow 1922
- Randle C. Rosenberger, M.D., Philadelphia, Pa., Elected member 1915, Charter Fellow 1923
- George W. Ross, M.D., Port Ewen, N. Y., Elected member 1935
- H. R. Ross, M.D., Topeka, Kans., Elected member 1928
- Onal A. Sale, M.D., Neosho, Mo., Elected member 1938
- George L. Salisbury, M.D., Wiskford, R. I., Elected member 1931, Fellow 1934
- Ruby S. Sandall, Tremonton, Utah, Elected member 1945
- Jose M. Santiago, M.D., Vega Bajo, P. R., Elected member 1944
- Francisco Sein, M.D., Laras, P. R., Elected member 1944
- Sister Zoe Schieswohl, R.N., Carville, La., Elected member 1937
- Hyman I. Spector, M.D., St. Louis, Mo., Elected member 1932
- Margaret I. Stanford, R.N., Charleston, S. C., Elected member 1928
- A. H. Stewart, M.D., Harrisburg, Pa., Elected member 1939
- George G. Taylor, M.D., Elkhart, Ill., Elected member 1943
- Willis C. Templar, M.D., Corning, N. Y., Elected member 1936

Paul A. Teschner, M.D., Chicago, Ill., Elected member 1943  
 Alexander L. Thomson, Wishaw, Scotland, Elected member 1930  
 Caroline Tillinghast, R.N., Albany, Ga., Elected member 1937  
 Edward F. Timmins, M.D., South Boston, Mass., Elected member 1944  
 Myron T. Townsend, Ph.D., Bloomington, Ill., Elected member 1938  
 Smith L. Turner, M.D., Williston, Fla., Elected member 1945  
 Charles Urbach, M.D., Philadelphia, Pa., Elected member 1941  
 Cornelia van Kooy, R.N., Madison, Wis., Elected member 1934  
 James B. Vaughn, M.D., Castlewood, S. D., Elected member 1934  
 Groesbeck Walsh, M.D., Fairfield, Ala., Elected member 1937  
 Mortimer Warren, M.D., Portland, Me., Elected member 1942  
 William C. Welling, Hartford, Conn., Elected member 1923, Fellow 1934  
 Stafford M. Wheeler, M.D., Bethesda, Md., Elected member 1939, Fellow 1942  
 Fred A. Wiggers, Toledo, Ohio, Elected member 1940  
 William F. Wild, M.D., Jackson Heights, N. Y., Elected member 1927, Fellow 1931  
 Margaret B. Wilson, Washington, D. C., Elected member 1915  
 Verne L. G. Wilt, D.D.S., Los Angeles, Calif., Elected member 1940

#### 8. SCHOOL LUNCH PROGRAMS

WHEREAS, the great stimulus to school meal programs provided through the passage of the National School Lunch Act of 1946 does not of itself assure that the potential benefits of school meals will accrue to all children attending school, be it

RESOLVED that the American Public Health Association encourage the establishment of school lunch programs according to accepted standards; encourage efficient administration of school meals from all aspects, nutritional, sanitary, educational, and economic; and encourage carefully controlled studies of the effect of school meals on nutritional status and home feeding practices.

#### 9. EQUAL OPPORTUNITY FOR PUBLIC HEALTH PERSONNEL

WHEREAS the public health profession is keenly aware of the fact that disease knows no boundaries of state or nation, of economic status, of race, color or creed, and

WHEREAS, one of the fundamental objectives of the Association is to foster a high professional standard for all workers in public health and to strive for the recognition of workers solely on the basis of their professional qualifications and capabilities, therefore be it

RESOLVED that the American Public Health Association endorse the thesis of equal opportunity for everyone in the field of public health and recommends a program of equal opportunities for employment, professional advancement and salaries in all activities of the public health profession regardless of race, color, or creed.

#### 10. APPRECIATION TO THE COMMITTEE ON CONSTITUTION AND BY-LAWS

RESOLVED that the American Public Health Association express its grateful appreciation to the Committee on Constitution and By-Laws for the spirit in which it has undertaken the very important and time-consuming task of revision of the Constitution and By-Laws. Specifically, appreciation is expressed to members of the committee: Drs. Haven Emerson, Franklin Foote, Charles E. Shepard, and especially the *Chairman*, Dr. Edward S. Godfrey, Jr.

#### 11. APPROVAL OF FORMATION OF THE WORLD HEALTH ORGANIZATION

WHEREAS, the attainment by all peoples of the maximum in health is the ultimate goal of all public health workers and,

WHEREAS, uncontrolled disease, espe-

cially communicable disease, in less favored countries is a common danger, and

WHEREAS, in many parts of the world there has been continued physical, mental, and social illness, and

WHEREAS, the attainment of world peace is to a considerable extent dependent upon the attainment of world health, and

WHEREAS, 61 countries have recently signified their interest in the development of the World Health Organization by the signing of the Constitution presented to the World Health Conference in New York City in July, 1946, therefore be it

RESOLVED that the American Public Health Association go on record as giving wholehearted approval to the formation of the World Health Organization and urge the immediate ratification of the Constitution of the World Health Organization by the Congress of the United States of America and by appropriate legislative bodies of those countries that have not already taken such action.

## 12. DEVELOPMENT OF BLOOD DONOR PROGRAMS

WHEREAS, human blood is assuming an increasingly important place in the treatment of disease and the saving of life;

WHEREAS, the value of this product is in proportion to its availability and adequacy of supply in any given locality;

WHEREAS, the American National Red Cross is prepared to assist in the creation and maintenance of state-wide and community blood donor pro-

grams to make human blood available to all elements of the community through members of the medical profession;

WHEREAS, such programs are undertaken only under the sponsorship of official health departments, medical societies, or hospital agencies; and

WHEREAS, concerted community effort is essential for the success of the blood donor program, a program which will be of immeasurable assistance to the medical profession in meeting the health needs of the people; now, therefore be it

RESOLVED that the American Public Health Association go on record as endorsing the participation of the American National Red Cross and its recognized chapters in state-wide and community blood donor programs; and be it further

RESOLVED that the American Public Health Association encourage the development and maintenance of state-wide and community blood donor programs through which human blood may be made readily available without charge for the product to persons who require it.

## 13. EARLY REPORTING OF MALIGNANT TUMORS

RESOLVED that the American Public Health Association endorse the principle of the early reporting of malignant tumors by physicians, hospital and diagnostic laboratories to the health department where the department is prepared to tabulate and analyze the material which would come in through these reports as an important step toward better understanding and control of cancer.

## THE RECIPIENTS OF THE LASKER AWARDS FOR 1946



*Individual Awards—Left to right: First row: Dr. John Friend Mahoney, Dr. Alfred Newton Richards, Dr. George Baehr; Second row: Dr. Alexander S. Wiener, Dr. Carl Ferdinand Cori, Dr. Philip Levine.*

The Lasker Awards for 1946 were conferred by the American Public Health Association on November 12, 1946, at the Opening General Session of the 74th Annual Meeting in Cleveland, Ohio, upon the following individuals and for the achievement noted:

**DR. CARL FERDINAND CORI**—For research in the rôle of anterior pituitary, insulin and hexokinase in carbohydrate metabolism.

**DR. KARL LANDSTEINER** (posthumously), **DR. ALEXANDER S. WEINER** and **DR. PHILIP LEVINE**—For research in the Rh factor.

**DR. JOHN F. MAHONEY**—For research in the penicillin treatment of syphilis.

**DR. ALFRED NEWTON RICHARDS**—For organization and administration of the Committee on Medical Research of the Office of Scientific Research and Development.

**DR. FRED L. SOPER**—For organization of eradication campaigns against yellow fever and malaria.

The following groups were cited for the achievement noted:

**THE ARMY EPIDEMIOLOGICAL BOARD**—For distinguished service in the control of infectious diseases, bringing a permanent enrichment to medical science.

**DR. FRANCIS G. BLAKE** was the recipient of the award on behalf of the group.



*Group Citations—Left to right: Dr. R. E. Dyer, Dr. G. E. Hilbert, Dr. Francis G. Blake, Dr. Fred C. Bishopp, Dr. George Baehr.*

THE BOARD FOR THE COÖRDINATION OF MALARIAL STUDIES—For accomplishments leading to a rational approach to the eventual solution of the malaria problem.

THE BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE—In recognition of distinguished service in the solution of problems involving the health and comfort of the Armed Forces, with particular reference to insect-borne diseases.

DR. FRED C. BISHOPP was the recip-

ient of the award on behalf of the group.

THE NATIONAL INSTITUTE OF HEALTH—In recognition of its fundamental contributions to the prevention and control of disease.

DR. R. E. DYER was the recipient of the award on behalf of the group.

THE NORTHERN REGIONAL RESEARCH LABORATORY—For studies leading to the mass production of penicillin.

DR. G. E. HILBERT was the recipient of the award on behalf of the group.

#### RESTATEMENT OF POLICY OF THE ENGINEERING SECTION

The Engineering Section of the American Public Health Association adopted the following statement of policy at the Annual Meeting in Cleveland, November 12, 1946:

"The Engineering Section Council proposes that the following statement of policy be adopted by the Section:

1. That the scope of activity of the Engi-

neering Section shall include all technical and professional interests in the field of environmental health.

2. That the Section Council shall coöperate with other public health engineering and sanitation groups seeking some practical medium of effort to unify and further the interests of all workers, and to that end each state or group of states in which an organization of workers in environmental health, recognized as such by the official state health agency, shall be invited to designate a representative of that group to be a member of an advisory

policy committee to the Engineering Section Council.

3. That the Section Council shall further explore the field of environmental health as a basis for such changes and modifications in Section activity as may be *desirable* to achieve its greatest usefulness in all phases of sanitation and the Section Council shall submit a report of its findings at the next annual meeting.

It further proposes that membership of the Section shall be informed regarding this action."

Through this announced policy the Engineering Section hopes to provide the needed professional representation for all categories of workers in the field of sanitation.

#### LT. COL. WILLIAM T. INGRAM APPOINTED ENGINEERING FIELD ASSOCIATE FOR A.P.H.A. STAFF

The Executive Board of the American Public Health Association has appointed Lt. Col. William T. Ingram, U.S.P.H.S., of Berkeley, Calif., as Engineering Field Associate.

As pointed out in the report *Local Health Units for the Nation*, by Dr. Haven Emerson and the committee, there is a need for more than 1,000 additional public health engineers to meet even minimum requirements in the field of environmental health. The need for professional leadership in this field has been recognized as a paramount problem by the Engineering Section Council and the Association's Committee on Professional Education. Consequently the Section Council with the approval of the Executive Board has undertaken a field project to explore the problems related to sanitary and public health engineering with a view toward:

1. More adequate provision of needed personnel employed in the sanitation of the environment

This statement is considered particularly timely by many members of the Section and the Association as a whole as positive action toward unification of the interested groups in the field of environmental sanitation. The decision of the Engineering Section also comes at a time when the Association is in a particularly fortunate position for contributing to the exploratory work called for by the work already undertaken by Francis B. Elder, Engineering Associate, and through his continued services and those of Lt. Colonel William T. Ingram, now on terminal leave from the U. S. Public Health Service, who has recently joined the staff of the Association as Engineering Field Associate.

2. Establishing the engineer in a position of greater usefulness to the administrator

3. Developing sanitary engineering and public health engineering as professional careers offering attractive opportunities to young men now entering our colleges and universities

4. Stimulating universities to the expansion



William T. Ingram

of undergraduate and graduate curricula which will prepare the student for his professional engineering rôle

5. Improving and broadening the environmental health services in all of the functional fields in keeping with state and community requirements

Col. Ingram brings to the Association a wide range of experience, including design, construction, surveying, stream pollution investigation and works maintenance. His public health experience includes work at local, state, national, and international levels with the San Joaquin Local Health District, State of California, U. S. Public Health Service, and United Nations Relief and Rehabilitation Administration.

Through his membership in professional associations he has developed a wide acquaintance with the sanitation field. He is a Fellow of the American Public Health Association and past

chairman of the Municipal Public Health Engineering Committee, Engineering Section; Associate Member, American Society of Civil Engineers; Member, Federation of Sewage Works Associations, and past secretary of the California Sewage Works Association; Member, American Water Works Association; Member and past chairman, Conference of Municipal Public Health Engineers. Col. Ingram is a Registered Civil Engineer in the State of California.

He received his A.B. in Civil Engineering at Stanford University and his Master of Public Health at Johns Hopkins University.

The field project has been underwritten for a period of two years by the National Foundation for Infantile Paralysis through funds from their March of Dimes, and by a group of sanitary engineering industries.

## APPLICANTS FOR MEMBERSHIP

*The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.*

### *Health Officers Section*

S. E. Ferreira, M.D., D.P.H., Island Medical Officer, Kingston, Jamaica, B.W.I., Asst. Director, Medical Services, Government Medical Service  
Hossein Hafezi, M.D., D.T.M., 124 Shahine Ave., Kakh, Tehran, Iran, Director, Dept. of Vital Statistics and Health Education, Ministry of Health  
J. A. Haney, M.D., 428 Market St., Steubenville, Ohio, Health Commissioner, Jefferson County Health Dept.  
Robert F. Hansen, M.D., M.P.H., 620 S. 3rd St., Louisville 2, Ky., Surgeon (R), U. S. Public Health Service  
Robert E. Harper, M.D., 603 E. 4th St., Tusculumbia, Ala., Colbert County Health Officer  
Julius G. Hart, Jr., M.D., 67 Myrtle Ave., Westport, Conn., Health Officer  
Charles R. Hayman, M.D., 414 S. State St., Dover, Dela., Deputy State Health Officer  
Clair A. Henderson, M.D., 23 E. Charlton, Savannah, Ga., Health Officer  
G. Lilian Hutton, M.B., Okanagan Valley

Health Unit, Kelowna, B. C., Canada, Director  
Joseph P. Kesler, M.D., 470 13th St., Ogden, Utah, District Health Officer  
Thomas Lindsay, British Embassy, 3400 Massachusetts Ave., Washington 8, D. C., Asst. Secretary, Ministry of Health  
Robert L. Loftin, M.D., Bay County Dept. of Health, Bay City, Mich., Director  
Dennys L. Lyall, Government Health Inspector, P. O. Bindura, Southern Rhodesia  
Athanasios G. Mandekos, M.D., M.P.H., Kyrillou Loukareos 4, Athens, Greece, Asst. Professor, Athens School of Hygiene  
Paul W. McCracken, M.D., 219 East Oregon Ave., Phoenix, Ariz., Director, Maricopa County Health Unit  
John R. Philp, M.D., 41 Edgewater Rd., P. O. Box 507, Nantasket Beach, Mass., Student, Harvard School of Public Health  
Marjorie Rowntree, M.D., 624 East Jefferson St., Louisville, Ky., Director, East Louisville Health Center, Louisville and Jefferson County Health Dept.  
Anton J. Schramel, M.D., City Hall, Room

- 613, Milwaukee, Wis., Deputy Commissioner of Health
- Cecil G. Sheps, M.D., 15 Dwight St., New Haven, Conn., Student, Yale School of Medicine, Dept. of Public Health
- Leland W. C. Sturgeon, M.D., D.P.H., 120 King St., Welland, Ont., Canada, Director and Medical Officer, Welland District Health Unit
- V. L. Van Duzen, M.D., 150 Mill, Big Rapids, Mich., Director, Mecosta-Osceola Health Unit
- Edwin S. Warrell, 14 Main St., Hingham, Mass., Exec. Health Officer, Health Dept.

### *Laboratory Section*

- Chester W. Anderson, 2223 Grant Ave., Rockford, Ill., Laboratory Director, Rockford Health Dept.
- E. Lawrence Barton, M.D., Provincial Dept. of Health, Div. of Laboratories, Toronto 2, Ont., Canada, Director of Laboratories
- Pedro P. Chanco, Jr., M.D., 522 San Antonio St., Paco, Manila, Philippines, Malariaologist, U. S. Public Health Service
- Raymond E. Daniels, 126 Erie Rd., Columbus 2, Ohio, Chief Bacteriologist, State Dept. of Health
- Irving M. Derby, M.D., 529 Church St., Newark, N. Y., Director of Clinical Laboratory, Newark State School and Wayne County
- Marvin W. Edwards, 2738 N. Grand River, Lansing 6, Mich., Public Health Bacteriologist, State Dept. of Health
- William F. Elias, Ph.D., 6302 Morton St., Philadelphia 44, Pa., Technical Director, Penicillin Division, Wyeth, Inc.
- Andrew R. Fodor, M.S., 90-79 Sutphin Blvd., Jamaica, N. Y., Technical Supervisor, Warren Medical Laboratories
- George T. E. Lloyd, 190 St. George St., Toronto, Ont., Canada, Asst. Bacteriologist, Laboratory Division, Dept. of Health, Province of Ontario
- Donald K. Hesson, M.A., 1443 Mulford Rd., Columbus, Ohio, Chief of Water Bacteriology, Ohio Dept. of Health
- Guido Iannarelli, 507 Nancy St., Charleston, W. Va., Senior Bacteriologist, West Virginia Hygienic Laboratory
- Morris T. Jones, Ph.D., 2542 Forest Place, East St. Louis, Ill., Bacteriologist, Automatic Canteen Co. of America
- Russell P. Knerr, Swiftwater, Pa., Director, Biological Division, National Drug Co.
- Mary Jane Knisely, State Dept. of Public Health, Carbondale, Ill., Bacteriologist
- Walter E. Machala, 411 N. Classen, Britton, Okla., Serologist, State Health Dept.
- Jacques Olivier, M.D., Hospital St. Vincent

- de Paul, Sherbrooke, Que., Canada, Director of Laboratories
- Joseph J. Portley, 1119 Hillside Ave., Plainfield, N. J., Formerly Bacteriologist, Dept. of Health
- Clifford W. Price, 4803 27th Rd. South, Arlington, Va., Bacteriologist, U. S. Food and Drug Administration
- Roger D. Reid, Ph.D., 5 Park Drive, Baltimore 7, Md., Bacteriologist, Hynson, Westcott and Dunning
- Merrill L. Riehl, 380 Garden Rd., Columbus 2, Ohio, Chief Chemist, State Dept. of Health
- Walter A. Rugh, Rt. 2, Box 893A, Walnut Creek, Calif., Owner of Clinical Laboratory
- John M. Sharpley, Froehling & Robertson, Inc., P. O. Box 737, Richmond, Va., Bacteriologist and Physiological Chemist
- Dorothea M. Slater, Glenbrook Quaker Farms, Oxford, Conn., Asst. Chemist, New Haven Water Co.
- Joseph E. Smadel, M.D., Army Medical Center School, Washington 12, D. C., Scientific Director, Div. of Virus and Rickettsial Diseases
- Lorena J. Thierbach, 2510 Van Vess Ave., San Francisco 9, Calif., Bacteriologist, San Francisco Dept. of Public Health
- Juanita J. Warner, 71 Quincy St., Rochester 9, N. Y., Bacteriologist, Rochester Health Bureau Laboratories
- Dixie M. Woodburn, P. O. Box 1498, Ketchikan, Alaska, Bacteriologist, Territorial Dept. of Health

### *Vital Statistics Section*

- Vivian B. Holland, 436 W. Wilson St., Madison, Wis., Director, Central Statistical Services Div., State Board of Health
- Elsie B. Hyatt, P. O. Box 210, Jacksonville, Fla., Administrative Asst., Bureau of Vital Statistics, State Board of Health
- H. Lukin Robinson, 200 Stewart St., Ottawa, Ont., Canada, Statistician, Dominion Bureau of Statistics
- Walter Schilling, M.D., Stanford University Hospital, San Francisco 15, Calif., Biometrist and Statistician
- Rose C. Willcox, 10402 St. Clair Ave. 211, Cleveland 8, Ohio, Principal Clerk and Deputy Registrar, Bureau of Vital Statistics, Dept. of Health
- Louise Y. Workman, 445 Beaumont Ave., Charlotte, N. C., Vital Statistician, City Health Dept.

### *Engineering Section*

- Elton J. Braddock, 4410 45th Ave., South,



- Seattle 8, Wash., Sanitation Inspector, Seattle Health Dept.
- James G. Brown, 116 N. Michigan Ave., Hastings, Mich., Public Health Engineer, Barry County Health Dept.
- Hal F. Daniels, Box 243, Manteo, N. C., Sanitarian, State Board of Health
- Russell C. Evans, D.V.M., Health Dept., Racine, Wis., Chief, Food and Sanitation
- Frank W. Hays, Jr., 860½ 24th Ave., N., St. Petersburg, Fla., Chief of Sanitation, Pinellas County Health Dept.
- William Hogan, 150 Glenarm St., Pasadena, Calif., Owner, U. S. Termite Control Corp., Ltd.
- James G. Livingston, 104-35 102nd St., Ozone Park 16, N. Y., Health Inspector, New York City Dept. of Health
- Clarence M. Moss, Sub-Treasury Bldg., Wall-Nassau-Pine, New York 5, N. Y., S. A. Sanitarian (R), U. S. Public Health Service, District No. 1
- Leonard M. Pratt, 52 E. St. Charles Rd., Villa Park, Ill., Sanitary Engineer, DuPage County Health Dept.
- Edward L. Stockton, 218 E. Erie, Albion, Mich., Acting Engineering Director, Calhoun County Health Dept.
- Charles O. Stoy, 778 N.W. 42nd St., Miami, Fla., Dairy Sanitarian, Dade County Health Dept.
- Ralph L. Tarbett, 5 Stockton Rd., Silver Spring, Md., Public Health Engineer, Montgomery County Health Dept.
- Guy M. Tate, Jr., M.S., P. O. Box 2591, Birmingham, Ala., Director, Bureau of Sanitation, Jefferson County Board of Health
- Joseph S. Taylor, 2614 Lincoln Ave., Richmond, Va., Chemical Engineer, Bureau of Sanitary Engineering, State Dept. of Health
- Emilio Tourn, M.S., Baez 495, Montevideo, Uruguay, S.A., City Sanitary Engineer
- Harry H. Utes, 510 Court St., The Dalles, Ore., Senior Sanitarian, Wasco-Sherman-Hood River County Health Depts.
- George A. West, 5 Mile Line Rd., East Rochester, N. Y., Supervisor, Div. of Food and Sanitation, Rochester Health Bureau
- Karol Stanley Wisnieski, 159 Willard St., Devencrest, Ayer, Mass., District Sanitary Officer, State Dept. of Public Health
- Peter P. Leone, M.D., 27 Princeton Rd., Elizabeth, N. J., Plant Physician, Standard Oil Co. of New Jersey
- Ronald M. P. Lockyer, 1026 Niles St., Bakersfield, Calif., Instructor in Public Health, Boy Scouts of America
- Charles M. McGill, M.D., M.P.H., 1022 S.W. 11th, Portland 5, Ore., Director, Division of Industrial Hygiene, Oregon Board of Health
- Karel Charles Pur, M.D., 27 Udolní, Brno, Czechoslovakia, Chief, Medical Staff, State Injury Insurance Office
- Irving R. Tabershaw, M.D., 10 Rockefeller Plaza, New York, N. Y., Regional Medical Director, Loss Prevention Dept., Liberty Mutual Insurance Co.

#### *Food and Nutrition Section*

- Mary G. Cameron, 1790 Broadway, New York 19, N. Y., Consumer Service Director, The Public Health Committee of the Paper Cup and Container Institute
- Lester C. Neer, D.V.M., 304 Bellemonte, Middletown, Ohio, Chief, Division of Food and Sanitation, Health Dept.
- Elbert M. Shelton, Ph.D., 2000 W. 14th St., Cleveland 13, Ohio, Research Director, The Baker Laboratories, Inc.

#### *Maternal and Child Health Section*

- Ruth O. Blakeslee, Children's Bureau, Washington, D. C., Director, Merit System Unit
- T. N. Laporte, M.D., D.P.H., 4235 Fabre, Montreal, Que., Canada, Asst. Director of Child Hygiene, City of Montreal

#### *Public Health Education Section*

- Mary C. Best, M.S.P.H., 5508 S. Greenwood, Chicago 37, Ill., Asst. Health Educator, U. S. Indian Service
- Fred T. Brown, M.S., 407 7th Ave., N., Nashville, Tenn., Director, Division of Health Education, State Dept. of Health
- Sylvia C. Davis, 97 Miami Ave., Columbus, Ohio, Health Education Worker, Columbus Tuberculosis Society
- Dorothy F. Dunn, M.S.P.H., 419 Campbell, Joliet, Ill., Health Educator, Will County Health Dept.
- Gertrude M. Hall, 1411 Crescent St., Suite 401, Montreal, Que., Canada, General Secy., Canadian Nurses Assn.
- Edward Huberman, Ph.D., 6 Tauxemont Rd., RFD 1, Alexandria, Va., Chief, Editorial Section, U. S. Public Health Service
- Babette S. Jennings, 707 Fullerton Ave., Chicago, Ill., Director of Out Patient Dept. & Social Service, Children's Memorial Hospital

#### *Industrial Hygiene Section*

- Margaret E. Gallagher, R.N., Kansas, Ohio, Industrial Nurse, France Stone Co.
- Dolor John Lauer, M.D., 5252 Beeler St., Pittsburgh 17, Pa., Fellowship in Industrial Medicine, University of Pittsburgh

- Johnnie Mae Lea, M.S.P.H., Boone County Health Dept., Madison, W. Va., Public Health Educator
- Lucy E. Little, R.N., 79-34 Elks Rd., Elmhurst, L. I., N. Y., Student, New York University
- Josafina Maldonado, M.S.P.H., 119 Reina St., Ponce, Puerto Rico, Public Health Educator, Dept. of Health
- William A. Mason, M.D., 81 Beers St., New Haven, Conn., Graduate Student, Yale School of Public Health
- Addison D. Owings, M.S., 3300 Pearl St., Hattiesburg, Miss., Assoc. Professor of Health, Mississippi Southern College
- E. Martin Paul, 378 The Arcade, Cleveland 14, Ohio, Co-Director, Ohio Foot Health Council
- David L. Piper, M.S.P.H., 1022 S. W. 11th Ave., Portland 5, Ore., Health Information Consultant, State Board of Health
- Isaac I. Simon, 45 Fountain St., New Haven, Conn., Student, Yale Medical School, Dept. of Public Health
- Esther E. Sweeney, R.N., 410 West 24th St., New York 11, N. Y., Field Representative, American Social Hygiene Assn.
- Gertrude F. Tenney, 1086 Whitney Ave., Hamden, Conn., Student, Yale Medical School, Dept. of Public Health
- Geneva K. Watson, 1219 Gordon Ave., Charlottesville, Va., Teacher
- Gracie R. Wilkes, 2237 E. 81st St., Cleveland 3, Ohio, Public Health Nurse, Cleveland Health Dept.
- Dorothy A. Worose, 311 E. 44th St., Long Beach 5, Calif., Graduate Student, Univ. of California, School of Public Health
- Public Health Nursing Section*
- Rose T. Amos, R.N., Rt. 1, Box 203, Corpus Christi, Tex., Junior Staff Nurse, City-County Health Unit
- Lila A. Anderson, 128 E. Edenton, Raleigh, N. C., Senior Asst. Nurse Officer, U. S. Public Health Service
- Ruby T. Beetham, 15322 Lake Ave., Lakewood 7, Ohio, Chairman, Health Program, Eliza Jennings Home
- Catherine C. Brophy, M.A., 75 Washington St., Port Chester, N. Y., Asst. Professor of Nursing Education, St. Johns University, Brooklyn, N. Y.
- Marion E. Compton, 904 West Green St., Urbana, Ill., Staff Nurse, Champaign-Urbana Public Health Dist.
- Lillian Davidson, R.N., 92 Hawthorne St., Brooklyn 25, N. Y., Student, New York University
- Isadora Denike, M.P.H., R.N., Meharry Medical College, Nashville 8, Tenn., Instructor of Public Health Nursing
- Catherine E. Denning, B.S. in N., R.N., 56 Hillhouse Ave., New Haven, Conn., Student, Yale University
- Eileen Downey, R.N., 607 E. Ann, Ann Arbor, Mich., Clinical Supervisor and Instructor in Obstetrics and Social Problems, St. Joseph Hospital
- Ovidia T. Evensen, M.N., 7934 Normile, Dearborn, Mich., Supervisor, Wayne County Health Dept.
- Alice M. Fay, M.S., Incarnate Word College, San Antonio, Tex., Assoc. Professor of Public Health Nursing
- Marjorie E. Gibson, R.N., M.S.P.H., 1105 S. Sixth St., Springfield, Ill., Asst. Supervisor, Nursing Services, Division of Services for Crippled Children
- Elizabeth Ann Groff, Community Health Society, Swarthmore, Pa., Director and Supervising Nurse
- Anne Gruenbaum, R.N., 66 Ft. Washington Ave., Apt. 32, New York 32, N. Y., Student, New York University
- Jeannette C. Hansen, R.N., 7115 10th Ave., Brooklyn 28, N. Y., Public Health Nurse, New York City Dept. of Health
- Mary F. Hart, R.N., 153 Lansdale Ave., Fairfax, Calif., School Nurse and Health Supervisor, Petaluma City Schools
- Leona Kerby, 101 W. Third St., Dayton 2, Ohio, Tuberculosis Supervisor, Dayton Division of Health and Visiting Nurse Assn.
- Louise Kincaid, 431 W. Union St., Gainesville, Fla., Director of Nursing, Alachua County Health Unit
- Mary J. Knapp, R.N., 45 Detroit, Akron, Ohio, Supervisor, Out-Patient Dept., St. Thomas Hospital
- Elsie B. Kocher, 10 Chestnut St., Albany, N. Y., Consultant Public Health Nurse (Tuberculosis), State Dept. of Health
- Elva M. Lewis, 2438 Haverhill Drive, Los Angeles 41, Calif., Tuberculosis Nursing Consultant, Los Angeles County Health Dept.
- Ethel P. Lynn, R.N., Lawrence-Douglas County Health Dept., Lawrence, Kans., Public Health Nurse
- Frances M. Michie, Dept. of Public Health, Boise, Ida., Orthopedic Nurse Consultant
- Josephine H. Moore, State Dept. of Health, Montgomery, Ala., Assoc. Public Health Nurse
- Mary G. Patterson, M.S., R.N., 318 2nd Ave., New York, N. Y., Teacher of Home Nursing, City Board of Education

Lucy C. Perry, M.A., 3632 Detroit, Toledo 12, Ohio, School Nursing Supervisor, Toledo Health Dept.

Georgina J. Reid, 5716 Schaeffer Rd., Dearborn, Mich., Director of Nurses, Wayne County Dept. of Health

Hazel Segner, 374 Delaware Ave., Buffalo, N. Y., Asst. Director, Buffalo Visiting Nurse Assn.

Elizabeth C. Stobo, Garrison, N. Y., Asst. District Supervising Nurse, State Dept. of Health

Iva Torrens, M.A., 826 Westcott St., Syracuse, N. Y., Instructor, Dept. of Public Health Nursing, Syracuse University

Ruth A. Wilbur, 1732 N. 73rd St., Milwaukee 13, Wis., Supervising Nurse, West Milwaukee Health Dept.

Garfield Heights, Cleveland, Ohio, Exec. Director, Cleveland Hearing and Speech Center, Community Fund Agency

Aline L. Lavi, Rt. 3, Donegan Rd., Waukegan, Ill., School Nurse, Waukegan Public Schools

#### *Dental Health Section*

Demetrios M. Hadjimarkos, D.D.S., M.P.H., Oregon State College, School of Home Economics, Corvallis, Ore., Assoc. Professor

Anna Mintz, D.M.D., 416 Marlborough, Boston 15, Mass., Dentist

Oren A. Oliver, D.D.S., Medical Arts Bldg., Nashville 3, Tenn., Chairman of Public Health Council, Tennessee Dept. of Public Health

Virginia B. Winterhoff, D.D.S., 716 Hickory Lane, Benton Harbor, Mich., Public Health Dentist in Berrien County

#### *Epidemiology Section*

Robert W. Babione, M.D., Bureau of Medicine and Surgery, Navy Dept., Washington 25, D. C., Head of Sanitation and Health Branch, Preventive Medicine Division

Martin M. Cummings, M.D., 215 Bradley Ave., Mt. Vernon, N. Y., Senior Asst. Surgeon, U. S. Public Health Service

Morton H. Edelman, M.D., 1070 Park Ave., New York 28, N. Y., Parasitology, Mt. Sinai Hospital

Thaddeus M. Koppa, M.D., M.P.H., 3229 Westminister, Dallas, Tex., Formerly, Director, Bureau of Epidemiology, Michigan Dept. of Health

Richard W. Linton, Ph.D., 240 Hornby Rd., American Express Co., Bombay, India, Special Representative, Lederle Laboratories, Inc.

Aurelio Malaga, 2115 "O" St., N.W., Washington, D. C., Professor of Epidemiology, Veterinary Faculty, Lima, Peru

C. B. Stewart, M.D., M.P.H., Dalhousie Public Health Clinic, Halifax, Nova Scotia, Canada, Professor of Epidemiology, Dalhousie Univ.

#### *School Health Section*

Sidney S. Chipman, M.D., 11 Morgan Ave., Norwalk, Conn., Graduate Student, Yale University

James W. Clarke, M.D., Admin. Bldg., Parkway at 21st St., Philadelphia 3, Pa., Asst. Director, Division of Medical Services, Public Schools

Wesley P. Cushman, D.Ed., Ohio State University, Men's Gymnasium, Columbus, Ohio, Assoc. Professor of Physical Education

Egner A. Eklund, D.D.S., R.D. 1, Garrettsville, Ohio, Asst. Supervisor of Mouth Hygiene, Cleveland Board of Education

George J. Fortune, M.A., 11103 Lincoln Ave.,

#### *Unaffiliated*

Harry J. Becker, 4932 Cordell Ave., Bethesda, Washington 14, D. C., Director, Administrative Methods Unit, U. S. Children's Bureau

Ralph B. Berry, M.D., 41 Walden St., Newtonville, Mass., Student, Harvard School of Public Health

Robert H. Bishop Jr., M.D., 2065 Adelbert Rd., Cleveland, Ohio, Director, University Hospitals

George W. Brooks, 10 Cherry St., Derby, Conn., Student, Dept. of Public Health, Yale University School of Medicine

Laura B. Deane, D.M.D., 9 Central St., Lowell, Mass., Dentist

Simon D. Doff, M.D., 362 Yale Ave., New Haven, Conn., Asst. Epidemiologist, City Dept. of Health

K. Pierre Dozois, Ph.D., 1600 Arch, Philadelphia, Pa., Director, Sales Education, Wyeth, Inc.

Laurence J. East, M.S., 817 S. Park, Springfield, Ill., Administrative Assistant, State Dept. of Public Health

Stephen Fromer, M.D., M.P.H., 21 Hodges Place, Staten Island 1, N. Y., Health Officer in Training, New York City Dept. of Health

Eleanor P. Hunt, Ph.D., Children's Bureau, 14th & Constitution, N.W., Washington 25, D. C., Asst. Director, Division of Statistical Research

William C. Kenner, 4728 Schlaff Rd., Dearborn, Mich., Food and Sanitary Inspector, Dearborn Health Dept.

Elizabeth K. Lazo, M.A., 10 Audubon Place, Radburn, Fairlawn, N. J., Statistician, Merit System Unit, American Public Health Assn.

Garra L. Lester, M.D., 12 Vincent Ave., Chautauqua, N. Y., Local Health Officer

Albert M. Settles, 1357 W. 3rd Ave, Columbus, Ohio, Supervisor of Personnel, State Dept. of Health

Herman R. Shepherd, 165 Linden Ave, Bridgeport, Conn., Aerosol Research, Bridgeport Brass Co.

Frederick Swanson, M.D., 333 Sherman Ave., New Haven, Conn, Student, Yale University, Dept. of Public Health

Frank Winchell, 307 Hogan St., Jacksonville, Fla, Manager, Jacksonville Tourist & Convention Bureau

---

### A.P.H.A. MEMBERSHIP DIRECTORY

The 1946 Membership Directory of the Association is at last a reality and every member is entitled to receive it without charge. Members who desire to receive a copy should send a post card or a letter to this effect to the Association office at 1790 Broadway, New York 19, N. Y.

population almost 50,000. Staff of 13 or more. Beginning salary \$6,600 plus \$750 travel allowance. For information, also on possible expansion with increase in responsibility and salary write Russell E. Pleune, M.D., Director, Northern Peninsula Office, Michigan Department of Health, Escanaba, Mich.

**Wanted:** Public health or sanitary engineer with engineering degree to direct environmental sanitation program in county health department in Southwestern Michigan. County is part of the field training area for the Michigan Department of Health. Beginning salary \$3,000 plus travel allowance. Write Box S-1, Employment Service, A.P.H.A.

**Wanted:** Public health nurses for staff positions in generalized public health nursing program in well established county (part of the field training area for Michigan Department of Health). Beginning salary \$2,000-\$2,400 depending on training and experience plus travel. Write Box N, Employment Service, A.P.H.A.

**Wanted:** Associate bacteriologist in charge of clinical laboratory in eastern state health department. B.S. degree plus three years' experience, thorough foundation in chemistry and background in bacteriology are requisites. New position with teaching duties. At present beginning salary \$3,000, annual increments, increase considered. Write Box L-3, Employment Service, A.P.H.A.

**Wanted:** Health Officers with experience or training in public health for County Health Units as follows: Duval County-Jacksonville; Gadsden County-Quincy; Putnam and Flagler Counties-Palatka. Also Medical Directors for Bureau of Maternal and Child Health and for Division of Industrial Hygiene, with headquarters in Jacksonville. Salaries determined by experience and training. Write State Health Officer, P. O. Box 210, Jacksonville, Fla.

**Wanted:** Health Educators to conduct general community health education programs at local level in Mississippi. Beginning net income \$2,400 per year with periodic increases, plus travel expenses. M.P.H. with major in health education from a recognized school required. Contact Dr. N. C. Knight, Director, Division of Health Education, State Board of Health, Jackson 113, Miss.

**Wanted:** State Vital Statistics Registrar. Male; \$300 to begin; Permanent. Minimum: 3 years' experience in birth and

death registrations; college graduate, preferably supplemented by one year graduate work in public health with major in vital statistics. Write or wire A. T. Johnson, Personnel Director, Oregon State Board of Health, 1022 S.W. 11th Avenue, Portland 5, Ore.

**Wanted:** Venereal disease control physician, St. Louis City Health Division. Special training and experience in venereal diseases; clinical, laboratory, and public health aspects required. Full-time. Civil Service. State qualifications and acceptable salary. Write Department of Personnel, City of St. Louis, Mo., 14th and Market Streets.

**Wanted:** Public health nursing supervisor. Should have B.S. degree, major in Public Health Nursing Supervision and minimum one year supervisory experience in generalized program. Salary \$3,000. Write Director, City-County Health Unit, 28 East Boulder, Colorado Springs, Colo.

**Wanted:** Medical-social worker for challenging position. Combination case work and community organization in Voluntary Health Agency, Denver, Colo. No travel. Write Box M, Employment Service, A.P.H.A.

**Wanted:** Qualified public health nurse with tuberculosis experience for progressive voluntary agency with active community program. West. Write Box N-2, Employment Service, A.P.H.A.

**Wanted:** Laboratory technician or medical secretary technician for clinical laboratory in Massachusetts. Five-and-a-half-day week, no night work. Write Box J, Employment Service, A.P.H.A.

**Wanted:** Medical Director for rural county, population 28,000, Midwest. Budget supplied entirely by county funds. Salary \$5,000 plus travel. One month annual vacation, pension system. Write Box Q, Employment Service, A.P.H.A.

**Wanted:** Staff nurse for generalized service including bedside and school nursing. Salary \$200 to \$240. City-County Health Department. Population 85,000. Seventeen staff nurses, 1 field supervisor, 1 clinic supervisor, 1 nursing director, 6 sanitarians, 1 medical director. Write Box U, Employment Service, A.P.H.A.

**Wanted:** Director of Nurses to supervise nurses and to direct a school for practical nurses in a new hospital. Opportunity to participate in the organization of a new hospital for the care of long-term illnesses, located at Cascade, Wash-

ington County, Maryland. Maintenance, health and retirement benefits. Proposed salary subject to approval \$3,000-\$3,750. *Requirements:* B.S. in nursing; one year's study in teaching and supervision of nursing or in hospital administration. One year in teaching and supervision of nursing in school of nursing or hospital plus one year as Director of School of Nursing; or five years as a Nursing Supervisor. Write Dr. J. A. McCallum, Cascade, Washington County, Maryland.

**Wanted:** Communicable Disease Control Physician with major part of work in V.D. Aptitude and interest in clinic services, and program direction preferable to experience which is desirable. Some public health training experience preferred. Fifty-bed contagious disease hospital. Beginning salary \$5,000 per year plus travel. Civil service standards. Give full qualifications first letter. Write Director, City Health Department, Lansing 7, Michigan.

### POSITIONS WANTED

**Parasitologist, M.S., Ph.D.** Experience: College teaching 8 years; U. S. Army parasitologist and tropical malaria control 4 years, laboratory director 1 year. Write Box M-470, Employment Service, A.P.H.A.

**Nutritionist, M.S. (nutrition).** Experience: State Health Dept. 1½ years, federal agency 1½ years, hospital dietitian 5 years. Write Box N-400, Employment Service, A.P.H.A.

**Public Health Editor** and information specialist, woman, considerable experience in preparation of health articles, pamphlets, radio, and newspaper work, public relations, desires position East or Midwest. Write Box M-478, Employment Service, A.P.H.A.

**Biologist, three (3) years' experience** as insect and rodent control officer at large permanent Army post; six (6) years' teaching experience, B.S. and M.S. degrees in biology and zoölogy; recent Capt., Sanitary Corps A.U.S.; present salary \$4,100 per year; seeks position as pest control engineer or biology instructor. Write Box E-500, Employment Service, A.P.H.A.

**Bacteriologist - Immunologist, Ph.D.** Major interest sanitary, including air, and food bacteriology. Experience as head health department division and university research program. Numerous publications. Age 38. Write Box L-502, Employment Service, A.P.H.A.

**Health Educator, female, age 37, Negro,** with three years' experience in Health Education, twelve years' experience in social work and community organization; capable of working with entire community; considerable experience working with racial and religious minorities. Write Box H-522, Employment Service, A.P.H.A.

**Writer, experienced, college graduate,** woman, general medical background, several scientific translations from German. Four years' research for official agency on history of state hospitals. Also experienced in organizing social service for physically handicapped. Desires position in editorial work, library research, translation, and administrative personnel work. Write Box H-526, Employment Service, A.P.H.A.

**Public Health Editor, experienced** in preparing health pamphlets, movie and slide films, articles and speeches. Seven years' experience in curriculum building and teacher training in adult education and 10 years' experience in teaching English. Write Box H-524, Employment Service, A.P.H.A.

### Fellowships in Medical Research

Dr. Thomas Parran, Surgeon General of the U. S. Public Health Service, announces approximately 120 one year fellowships in medical research open to men and women who are graduate science students.

The National Cancer Institute, a division of the National Institute of Health, has funds to train approximately 30 physicians in the diagnosis and treatment of cancer. Doctors wishing to specialize in this field may be appointed as trainees and be assigned to authorized institutions.

The National Institute of Health offers research fellowships to graduates of accredited colleges who have majored in biology, chemistry, dentistry, entomology, medicine, physics, and other scientific fields. Senior research fellowships are awarded at a yearly stipend of \$3,000 to those who hold a Ph.D. degree in one of the specified scientific subjects. Junior

fellows receive \$2,400 annually and must hold an M.S. degree or have completed the equivalent of such a degree in post-graduate study. Fellowships may be renewed for a second year. Applications for fellowships and traineeships should be sent to the Director, National Institute of Health, Bethesda, Md.

The U. S. Public Health Service also administers fellowships for health personnel from other American republics and the Philippine Islands. Applications for these fellowships should be sent to The Surgeon General, U. S. Public Health Service, Washington 25, D. C.

## Fellowships for the Training of Health Educators

The U. S. Public Health Service announces that fellowships leading to a Master's degree in Public Health in the field of health education are again being offered. Candidates must be U. S. citizens between 22 and 40 years of age, must hold a bachelor's degree from a recognized college or university, and must be able to meet the entrance requirements of the accredited school of public health of their choice.

In addition to the degree, courses in the biological sciences, sociology and education may be required. Training in public speaking, journalism, psychology, and work in public health or a related field are considered desirable qualifications.

Tuition, travel expenses for field training and a monthly stipend of \$100 will be provided out of funds furnished by the National Foundation for Infantile Paralysis. The year's training which begins with the 1947 fall term, consists of 8 or 9 months of academic work and 3 months of supervised field experience.

Veterans are encouraged to apply and will be paid the difference between the allowance under the G.I. Bill of Rights and the monthly stipend of \$100. Employees of local and state health departments are not eligible since Federal grants-in-aid are already available for such training purposes.

Application blanks may be obtained by writing the Surgeon General, United States Public Health Service, Washington 25, D. C., and must be filed prior to March 15, 1947.

## Exchange of Public Health Personnel between Hawaii and the Mainland

An opportunity for public health nurses, sanitary and medical officers to work in the Hawaii Health Department

is now offered under the new exchange personnel program inaugurated by the Board of Health in the Territory.

As passed by the Hawaii legislature, the enabling act calls for an exchange of personnel for a period not to exceed a year.

Provisions in the act state that each person exchanged by the health department of any state must possess qualifications equal to the qualifications of the person exchanged for him from Hawaii and must hold in the state health department a position which is equivalent to the position held by the person exchanged for him in Hawaii.

Salaries for both exchanging parties will be paid by the home employer. Travel, board, lodging or other such expenses will not be paid by the Territorial Health Department.

Eligible persons employed on the mainland who desire to take advantage of this exchange program are requested to write Dr. Richard K. C. Lee, Assistant Health Executive of the Board of Health, Territory of Hawaii.

## Openings for District Health Officers in New York City

The City of New York plans to open applications for the position of District Health Officer in January. The requirements are an M.D. degree, one year internship or residency in a general hospital approved by the American Medical Association, a Master's degree in Public Health from an institution which has such a degree registered by the State of New York, three years' satisfactory full-time experience as health officer or assistant health officer or in another administrative position in public health. The minimum salary is \$3,000, and at present four vacancies exist at \$5,750 per annum. In addition, an annual bonus of \$350 is given. Inquiries should be directed promptly to the Commissioner, Municipal Civil Service Commission, 299 Broadway, New York 7, N. Y.

## Advertisement

## Opportunities Available

WANTED—(a) Director of division of venereal disease; must be qualified not only in diagnosis and treatment of venereal disease but familiar with direction of general control program; population of county two million; Middle West; \$7,000 plus traveling expenses. (b) Medical consultant; field appointment; new organization having state-wide program; headquarters in winter resort city, South. (c) Large city in Pacific Northwest requires school physician, preferably with public health training; 20,000 students; excellent opportunity for one interested in reorganization of school health program; corps of six nurses, supervisor of nurses, and dental hygienist; advantageous if physician has background in physical education. (d) Physicians who have specialized in pediatrics, tuberculosis, venereal disease, and industrial hygiene for administrative appointments with municipal department of health; public health training or experience required; salaries dependent upon qualifications but not less than \$6,000; Pacific Coast. (e) Public health physicians for assignment in Bolivia and, also, two public health men for posts in the Amazon area of Brazil. (f) Young woman physician for student health appointment, university expecting enrollment of 18,000 (13,000 men); new student health building; professional staff comprised of seven internists, three psychiatrists, allergist with other specialties represented on part-time basis; well equipped infirmary of 60 beds; complete x-ray and laboratory facilities; possibility of teaching appointment if physician wishes it; salary range \$4,500 to \$5,250 with possibility of early increase. **PH12-1** The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago 11.

WANTED—(a) Health educator to take charge of state-wide program, division of one of the national organizations; South; \$4,000 including travel expenses; man preferred. (b) Health educator to become associated with Chicago agency; master's degree in public health education desirable; man or woman; \$3,500. (c) Health educator; general community health program; salary dependent upon qualifications; South. (d) Health educator qualified to serve as consultant to health educators on staff of state department of health; Ph.D. whose training has included year of graduate training in field of public health with major emphasis on education required;

\$3,600–\$4,800. **PH12-2** The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago 11.

WANTED—(a) Nutritionist; to direct district staff of nutritionists, municipal department of health, \$345; West. (b) Nutritionist with minimum two years' experience to become associated with maternal and child health program of state department of health; would also be associated with university medical school; Middle West. (c) Nutritionist to join staff of visiting nurses' association; duties include some teaching; East. **PH12-3** The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago 11.

WANTED—(a) Public health nursing supervisor; university medical center of the East; \$2,660–\$3,660. (b) Executive secretary and educational consultant; both positions require women with Bachelor's degrees; \$250 with periodical increases; Pacific Coast. (c) Student health nurse to take charge of revamped health program; coeducational college; Southwest. (d) Field nursing consultants in tuberculosis, school of nursing, pediatrics and general nursing; headquarters in university town of Middle West; \$2,900–\$3,300. (e) Public health nurse to supervise newly constructed outpatient department, fairly large hospital, Hawaii; transportation paid. **PH12-4** The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago 11.

WANTED—(a) Sanitary engineer; state department of health which is being reorganized; salary for recent graduate, \$250, salary for experienced candidate, \$350. (b) Industrial hygiene engineer; municipal health department; Pacific Northwest; \$350–\$400. (c) Statistician; division of cancer control, state department of health; should be able to develop broad statistical department covering several public health activities as well as the cancer field; research-minded person required; although man preferred, woman eligible; \$4,500. (d) Executive secretary for health and hospital council agencies; post created for community coordination; man preferred, woman eligible; university medical center; East. (e) Sanitarian; large industrial company; Chicago. **PH12-5** The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago 11.

## Advertisement

## Opportunities Wanted

Sanitarian; B.S. degree in civil engineering; six years, maintenance engineer with large institution; seven years, sanitary engineer where his assignments have been varied, including insect control, water supply, sewage disposal and general environmental sanitation; in early thirties; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Young physician experienced in the field of industrial hygiene and preventive medicine; M.D. Middle Western school; M.S. degree in public health medicine; graduate training also in industrial medicine; before en-

tering military service, held administrative position in industrial medicine; expects early discharge; for further information, please write Burneice Larson, Director, The Medical Bureau, Palmolive Building, Chicago 11.

Health educator; M.S. degree in health education; doctor of education degree (major in school health education); eight years on staff of state university in department of health education; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.



Public health nurse is available for administrative appointment; Bachelor of Science degree in Public Health and Hospital Administration; Master's degree in Guidance and Personnel; three years' teaching experience; six years, director of outpatient department, large teaching hospital; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Health educator; B.A. in education with teacher's certificate from Middle Western university; considerable work toward Master's degree in public health; several years, dental hygienist in public schools of large city; five years, dental health educator, state department of health; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

---

**U. S. Public Health Service Announces Examinations for Nurses.** Examinations for the appointment of registered nurses to the U. S. Public Health Service will be given during March and April, 1947, in cities throughout the nation, according to an announcement made by Miss Lucile Petry, Chief of the Division of Nursing.

"The Public Health Service offers opportunities for recent graduates as well as experienced nurses," Miss Petry said.

"For the new registered nurse who can qualify here is an opportunity to acquire good initial experience. The Public

Health Service offers the experienced nurse a permanent career with the advantages of professionally stimulating work, job security, regular salary increases, and opportunities for advanced study and promotion on the basis of training and ability."

Nurses interested in obtaining further details concerning appointment to the U. S. Public Health Service should write to Miss Lucile Petry, Chief, Division of Nursing, U. S. Public Health Service, Washington 25, D. C. Specific dates for examinations will be announced shortly.

## NEWS FROM THE FIELD

### RAGWEED CONTROL

According to a recent release of the New York City Health Department, pollen counts made by the National Pollen Survey Committee in New York City during the summer of 1946 were the lowest ragweed counts since 1937. This favorable condition is attributed in part to the 6 week ragweed control program instituted through the summer of 1946. At least 3,000 acres of ragweed were treated during the campaign which utilized the facilities of many of the city's departments plus the services of Boy Scouts and other volunteer groups.

The public interest in ragweed control programs utilizing the herbicide 2,4-D, has been great, not only in New York City but also in Jersey City, N. J., and Washington, D. C., where programs were also carried on last summer. More than 100 visitors registered at the exhibit on ragweed control presented by the New York City Health Department in the scientific exhibits at the Annual Meeting of the Association in Cleveland. The paper describing similar methods for the control of poison oak and poison ivy presented by Dr. Clair E. Turner\* at the Annual Meeting also evoked general interest.

To help meet the anticipated demand for information and the need for trained workers in other communities, New York University announces a special series of lectures under the title of "Control of Plants Detrimental to Health," to be sponsored jointly by the university and several of the health departments in the New York metropolitan area. The course is scheduled to start on Friday evening, March 7, 1947, at 7:30, and

will continue for at least 5 subsequent Friday evenings. An advisory group consisting of public health workers, horticulturists and representatives from New York University are preparing the curriculum and a syllabus and planning for the course in general. The faculty for the lectures will be composed of individuals who have worked in ragweed control programs.

Registration will be \$5 and will be open to employees of health departments, park commissions, mosquito control commissions, departments of public works and any other official bodies interested, as well as representatives of volunteer groups working toward the control of ragweed. Additional information can be obtained from Professor Warren Bower, Assistant to the Dean, Division of General Education, New York University, New York 3, N. Y.

### WESTERN RESERVE INSTITUTE ON MEDICAL CARE AND HUMAN VALUES

Western Reserve University, Cleveland, Ohio, has announced an Institute January 16, 17, and 18 on the subject "Better Medical Care and Human Values—A Challenge to Social Workers." Faculty chairman is Professor Agnes H. Schroeder of the Medical Social Work Department, School of Applied Social Sciences. Persons admitted are required to be graduates of a school of social work or college graduates with a minimum of three years' employment in a social or health agency. Attendance is limited to 50 persons. Tuition is \$12.50. The leader of the Institute will be John Peters, M.D., Professor of Medicine, Yale University School of Medicine, New Haven, Conn., and secretary of the Committee of Physicians for the Improvement of Medical Care, Inc.

\* See page 7, this issue.

## RESTAURANT SANITATION ORDINANCE

The progress of the adoption of the Standard Restaurant Ordinance (or one based on it) as prepared by the U. S. Public Health Service, is described in the *News Release* dated November, 1946, of the Milk and Food Section, Sanitary Engineering Division of the U. S. Public Health Service. According to this release these ordinances are in effect in communities embracing a population of over 40,000,000. Fifteen states and the District of Columbia, plus 176 counties and 373 municipalities, have adopted such ordinances.

Copies of the suggested ordinance, *Ordinance and Code Regulating Eating and Drinking Establishments*, can be obtained from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., for 20 cents each.

## RED CROSS SERVICES TO VETERANS

The Motion Picture Distributing Office of the American Red Cross announces "Facing Tomorrow," a "short" motion picture designed to make known to a wide number of ex-servicemen and their families the free services available to them from their Red Cross in dealing with vital post-war problems of insurance, benefits, allotment checks, and many others. The film is available without charge, except for shipping costs. The 16 mm sound film is in two reels, running 14 minutes. Order from Motion Picture Distributing Office, American Red Cross, 40 East 49, New York 17, N. Y.

RICHARD PEARSON STRONG AWARD TO  
LONDON'S DR. FAIRLEY

The fourth annual award (1947) of the Richard Pearson Strong Medal was recently made to Neil Hamilton Fairley, M.D., of the London School of Hygiene and Tropical Medicine at a special dinner of the American Foundation for Tropical Medicine. Dr. Fairley was cited as "a soldier who has conquered

disease, relieved the suffering and saved the lives of innumerable persons in many lands." During the war he was chairman of the combined Advisory Committee on Tropical Medicine to General MacArthur. As Brigadier of the Australian Army Medical Corps he directed the Medical Research Unit of the Australian Army at Cairns, Australia. This unit demonstrated the successful chemotherapeutic control of malaria in troops in the South West Pacific. Information secured on malaria and other tropical diseases, such as scrub typhus and dengue fever, "made possible an earlier termination of the war against the Japanese Empire."

The award, together with a \$500 cash honorarium, was established through a gift of the Winthrop Chemical Co. The medal is struck in white metal palladium. The presentation to Dr. Fairley was made by Colonel Strong in whose honor the award was named and who was its first winner in 1944.

AMERICAN PHARMACEUTICAL MANUFACTURERS' ASSOCIATION AWARD  
TO MAYO FOUNDATION

On December 9, in New York City, the eighth annual award of distinction of the American Pharmaceutical Manufacturers' Association was made to The Mayo Foundation for Medical Education and Research "in recognition of its great contributions to public health, by fundamental research in the field of the medical sciences, for the profound and lasting benefit of mankind." This is the third consecutive year in which this award has been made to a group rather than to individual research workers.

FOUR NEW STATE DISTRICT HEALTH  
OFFICERS IN MAINE

The Bureau of Health of the Maine Department of Health and Welfare announces four new district health officers secured in five months:

They are Maurice A. Priest, M.D., with headquarters in Augusta; John Kazutow, M.D., Machias; Dean Fisher, M.D., Portland; and William J. Young, M.D., Auburn.

#### FLORIDA PUBLIC HEALTH ASSOCIATION, INC.

##### New Officers Elected:

*President* — Frank V. Chappell, M.D., Tampa  
*1st Vice President*—Ruth E. Mettinger, R.N., Jacksonville  
*2nd Vice President*—Angus Laird, Tallahassee  
*Secretary-Treasurer*—Elsie Hyatt, Jacksonville

##### Board of Directors, in addition to above:

Wilson T. Sowder, M.D., Jacksonville  
 George A. Dame, M.D., Jacksonville  
 W. H. Miller, Miami  
 Robina Tillinghast, St. Petersburg  
 Lorenzo L. Parks, M.D., Jacksonville  
 Elizabeth Reed, Jacksonville  
 B. G. Barfield, Gainesville  
*Representative on A.P.H.A. Governing Council*—Wilson T. Sowder, M.D.

#### NATIONAL MALARIA SOCIETY

The National Malaria Society held its 29th annual session conjointly with the Southern Medical Association in Miami, Fla., November 4-7. During a three day session, papers setting forth the advances in the various fields of malaria were presented.

##### The officers for 1947 are:

*President*—Colonel Mark D. Hollis  
*President-Elect*—Dr. E. Harold Hinman  
*Vice-President*—Dr. Wendell Gingrich  
*Secretary-Treasurer*—Dr. Martin D. Young  
*Directors*—Dr. Justin M. Andrews, L. M. Clarkson, W. H. W. Komp

#### INTERNATIONAL ASSOCIATION OF MILK SANITARIANS

The International Association of Milk Sanitarians, Inc., at its Annual Meeting, October 24-27, took its first constitutional step in changing the name to International Association of Milk and Food Sanitarians, Inc. Final action will

be determined by a mail vote within the next several months.

##### Newly elected officers are:

*President*—R. G. Ross, D.V.M., Tulsa, Okla.  
*First Vice-President*—W. D. Tiedeman, Albany, N. Y.  
*Second Vice-President*—A. W. Fuchs, Washington, D. C.  
*Third Vice-President*—M. R. Fisher, D.V.M., St. Louis, Mo.  
*Secretary-Treasurer*—J. H. Shrader, Ph.D., Wollaston, Mass.

The Executive Board authorized the name of the *Journal of Milk Technology*, the official organ of the Association, to be changed to the *Journal of Milk and Food Technology*, effective with the beginning of the next volume.

#### CONNECTICUT LOCAL HEALTH OFFICERS BACK HEALTH DISTRICT PLAN

Connecticut health officers at their spring meeting on May 29, 1946, in Hartford voted the appointment of a committee to draft a resolution on the need of full-time departments of health for cities and towns in Connecticut, and the consideration of financial aid by the state to proposed district departments of health. At the recent official meeting of the health officers of Connecticut, held on November 20, 1946, in Bridgeport, this committee presented the following resolution which was adopted unanimously by all health officers, who filled the meeting room:

WHEREAS, The health officers of the State of Connecticut are cognizant of the limitations of a local department of health under part-time health officers such as now exist in most of the towns, boroughs and small cities and

WHEREAS, The House of Delegates of the American Medical Association, on June 10, 1942, passed a resolution urging the establishment of full-time modern health services to provide complete coverage of the nation's area and population, and

WHEREAS, The American Public Health Association at its Seventy-first Annual Meeting on October 29, 1942, resolved that all practical measures be taken by the officers and the Executive Board of the American Public

Health Association to promote the creation and adequate support of health services by local government throughout the United States to the end that no community of our people shall be left without the public care which can be best supplied only through full-time trained medical officers of health with sufficient numbers of qualified assistant personnel, be it

RESOLVED, That the health officers of the State of Connecticut urge the State legislature to take formal action on the Health District Bill which would provide financial assistance to local communities to establish full-time districts of health, and be it further

RESOLVED, That copies of this resolution be sent to the Governor and the Legislative Council of the State of Connecticut.

#### COLUMBIANA COUNTY, OHIO, IMPLEMENTS PUBLIC HEALTH SURVEY

A survey of public health facilities in Columbiana County, Ohio, was recently conducted by the staff of the Committee on Administrative Practice of the American Public Health Association under the direction of Roscoe P. Kandle, M.D., M.P.H., at that time Associate Field Director for the Committee.

The Columbiana County Public Health League has announced that a number of the major recommendations of the survey are now in process of attainment. The November election supported the proposal for a special levy of 8/10 mill for tuberculosis with a 78 per cent majority. In the opinion of the League, the health survey materially assisted in this attainment.

Archie W. Dalton, the Executive Secretary of the League, has announced that the general health district board is now receiving applications for a qualified health commissioner and that it is hoped shortly to announce the name of the appointee.

#### SEVENTEEN ILLINOIS COUNTIES VOTE COUNTY HEALTH DEPARTMENTS

Under the referendum provisions of Illinois' Searcy-Clabaugh Law, 17 counties of the state voted, at the recent election, to establish locally

financed and administered county health departments.

The favorable vote will provide these counties with full-time professional public health service as soon as the administrative units can be organized and personnel secured. This announcement was made by Dr. Roland R. Cross, Illinois State Health Officer, on November 8. Of the 17, 7 will be single county units, the remaining 10 counties will be set up in three bi-county and one four-county units. When these new counties are in operation a total of 22 counties will have full-time local health protective service covering about 1,200,000 persons.

#### PRENTISS AWARD TO MARY CONNOLLY

Mary Connolly, Director of Health Education, School of Public Health, University of Michigan, was presented the third annual Elizabeth S. Prentiss National Award in Health Education in Cleveland on November 12, 1946, by Dr. W. W. Peter, Chairman of the Cleveland Health Museum's National Advisory Council. The award was established in 1943 by the Museum for an individual or persons working in coöperation who have made outstanding contributions to public health education.

Miss Connolly was Director of Health Education in the Detroit Health Department for 25 years before 1943 when she joined the university staff, where, in the words of the citation, she was a "Down-to-earth" health educator, doing much by way of writing and community organization to instill an expanding knowledge of personal and community health into the minds of Detroiters.

Earlier winners of the award were Mary and Evart G. Routzahn in 1944, and Prof. C.-E. A. Winslow in 1945.

#### ADDITIONS TO HOSPITAL FACILITIES IN NEW YORK CITY

Plans for the expansion of two of New York City's Medical Centers were

recently announced. Both represent coöperation between municipal and voluntary agencies. The first is for the James Ewing Hospital for cancer, a city hospital for the free treatment of cancer patients. It will be a 12 story building located on grounds adjacent to both the Memorial Hospital for Cancer and Allied Diseases, a voluntary hospital, and to the Sloan-Kettering Institute for Cancer Research now under construction. Each of the three will be a unit of a projected Memorial Cancer Center. Adjacent also are the Cornell Medical College, New York Hospital Medical Center, and the Rockefeller Institute for Medical Research.

The New York University-Bellevue Medical Center plans call for a \$50,000,000 improvement program by the New York University Medical School. The buildings will include the 20 story College of Medicine and hospital, the latter designed primarily to serve patients in the modest or middle income class; a 10 story dormitory for medical students; a new university clinic; and the Institute of Forensic Medicine. Similarly, the City has announced plans to rebuild all but the newest buildings of Bellevue Hospital which now cover blocks from 26th to 30th Streets on First Avenue. The University units of the Medical Center will cover four additional blocks from 30th to 34th Street.

#### MEAD JOHNSON VITAMIN A FUND

The American Pediatric Society has received \$15,000 from Mead Johnson and Company, Evansville, Ind., to be known as the "Mead Johnson Vitamin A Fund." Grants-in-aid from this fund will be used for research and studies in the field of fat soluble vitamins. A committee consisting of Drs. Edward A. Park, Baltimore; Allan M. Butler, Boston, and Daniel C. Darrow, New Haven, Conn., was appointed to administer all grants-in-aid in connection

with the use of funds. All applications for grants and correspondence should be addressed to Dr. Park, 601 North Broadway, Baltimore 5.

#### WORK OF COMMISSION ON HOSPITAL CARE MADE A PERMANENT DEPARTMENT OF AMERICAN HOSPITAL ASSOCIATION

The American Hospital Association has announced the establishment of a department within the Association to continue certain functions previously carried on by the Commission on Hospital Care which disbanded on October 1, 1946. The Association will continue to code and tabulate hospital schedules for state survey commissions and will assist states with advice and exchange of information on developing satisfactory study methods. Maurice J. Norby, Director of Research of the Commission on Hospital Care, has been appointed Assistant Director of the Association in charge of this new activity. He will be assisted by Ronald B. Almack as research analyst and by U. S. Public Health Service personnel. Dr. David B. Wilson of the Service will act as liaison officer between the Association and the Service.

This new department is made possible by grants of \$10,000 a year for two years each by the W. K. Kellogg Foundation and the National Foundation for Infantile Paralysis. The Commonwealth Fund will publish the report of the Commission on Hospital Care. It is scheduled for 1947.

#### YUGOSLAV VISITORS IN UNITED STATES

Among visitors from abroad who attended the Annual meeting of the American Public Health Association at Cleveland were four men from Yugoslavia, three physicians and a sanitary engineer, who are now in the United States travelling and studying under the sponsorship of the United Yugoslav Relief Fund of America. They will be

in this country for a period of four months, observing American public health methods and administrative programs, and studying nursing and medical education and research.

To date they have visited medical and nursing schools in eastern universities, research institutions and hospitals, and are now at the University of Michigan, living at the English Language Institute, while working at the School of Public Health and having conferences in the medical and nursing schools.

The positions that these men held abroad are of interest: Dr. Radivoje Berovic is chairman of the Department of International Medicine at the University of Belgrade Medical Faculty. He is also chairman of the Committee on Medical Education for all of Yugoslavia. (This committee is a subcommittee of the Central Commission for Public Health in Yugoslavia, which corresponds to the USPHS.)

Dr. Alexander Rotovic is assistant professor in the Institute of Physiology and Physical Therapy Clinic at the University of Belgrade. Dr. Rotovic has had wide experience in research work in Czechoslovakia, Hungary, and in his own country.

Dr. Ksenofon Sahovic is head professor of the Medical Faculty of the University of Belgrade, Director of the university's Pathological Institute, and Chairman of the Clinic for Cancer and Degenerative Diseases at the university. He is a member of many learned societies in Europe.

Mr. Bogdan Teodorovic is a graduate of the School of Engineering of the University of Zagreb, and received the degree of Engineer of Architecture in 1926. In 1927 he was appointed to the Hygiene Institute of Zagreb in the Department of Sanitary Engineering. In 1929 and 1930 he was in the United States on a fellowship grant from the Rockefeller Foundation, studying with Professors Drinker and Fair at Harvard

University. At present Mr. Teodorovic is one of the outstanding sanitary engineers of Yugoslavia, and is serving in the Ministry of Health for the State of Croatia, with offices in Zagreb.

#### SOUTHERN BRANCH, A.P.H.A., ANNOUNCES NEW MEETING PLANS

The Southern Branch of the American Public Health Association, organized in 1932, held a meeting in Miami early in November in connection with the Annual Meeting of the Southern Medical Association. The new officers include:

*President*—John W. Williams, M.D., Jefferson City, Mo.

*Secretary-Treasurer*—John M. Whitney, M.D., New Orleans, La.

*Representative to the Governing Council A.P.H.A.*—Felix J. Underwood, M.D., Jackson, Miss.

At this meeting, the Southern Branch of the A.P.H.A. voted to adopt a plan to hold meetings hereafter separate from the meetings of the Southern Medical Association and at a time which will not conflict with other meetings of similar interest. Dr. Whitney has announced that definite plans are being formulated for a spring meeting of the Branch at a time and place shortly to be announced.

#### UNITED STATES ARMY OPENS REHABILITATION CENTER FOR HARD OF HEARING

"News Notes" for October 15, 1946. Office of the Surgeon General, U. S. Army, reports the opening of a new service at Walter Reed General Hospital. This service consists of a new center for the rehabilitation of the deafened and hard of hearing. The Aural Rehabilitation Center, as it is called, is designed to receive military personnel, as "students," those who have finished with normal treatment and surgery but who require rehabilitative attention. Major Henry C. Barnaby

will be the director. When filled to capacity there will be 250 under treatment.

## PERSONALS

### Central States

GLENN H. BAIRD, M.D.,† formerly of U. S. Public Health Service, has been appointed Director of Venereal Disease Control for the Kansas State Board of Health. He succeeds REGNAR M. SORENSON, M.D.,\* who was lent to Kansas during the war by the Public Health Service.

CAPTAIN ERNEST W. BROWN (MC), U.S.N. retired, has accepted an appointment with the Headquarters staff of the Council on Industrial Health of the American Medical Association, effective December 1, 1946. During the recent war he was attached to the Office of the Surgeon General of the Navy in charge of industrial hygiene research, submarine medicine, and chemical warfare medicine.

CHESTER M. BUNDY, M.D., has been appointed Director of the Division of Tuberculosis Control, Indiana State Board of Health, Ind. He succeeds CARL C. KUEHN, M.D., who has been granted a leave to study public health at the University of Michigan.

LEROY L. FATHERREE, M.D.,\* has been appointed new full-time Health Director of the reorganized Omaha, Neb., Department of Health. Other new appointments for this department include: B. A. BAKER, Sanitary Engineer, and LEETA A. HOLDREGE,† Director of Nurses.

J. BRENNAN GISCLARD† has resigned from the position of the Bureau of Industrial Health, Michigan Department of Health, to accept a similar position with the Detroit Department of Health.

HAROLD C. HAYNIE, M.D., recently re-

leased from military service, has been appointed Assistant Medical Director of the Ohio State University Hospital and its out-patient department, and as Assistant Professor of Medicine and Hospital Administration in the Medical School.

WILLIAM C. KEETTEL, JR., has been appointed Assistant Professor of Obstetrics and Gynecology at the State University of Iowa College of Medicine, Iowa City. JOHN W. DULIN, M.D., who resigned as Professor of General Surgery at the State University of Iowa College of Medicine, July 1, will rejoin the college of medicine faculty as Clinical Professor of Surgery at the University Hospital.

LAURENCE T. ROGERS, PH.D.,† formerly Assistant Secretary, Health Division of the Council of Social Agencies, Chicago, Ill., has joined the University of Oklahoma faculty at Norman as Professor of Health Education.

SIGSBEE R. SELJESKOG, M.D., has been appointed Superintendent of the Elizabeth Kenny Institute, Minneapolis, Minn., succeeding FRANCIS E. HARRINGTON, M.D.†

MILTON L. SHURR has been named Director of Public Health Education and Coördination for Tulsa County, Oklahoma, a newly created position with the Tulsa City Health Department. Mr. Shurr has recently been Health Consultant in Omaha, Neb.

RICHARD H. YOUNG, M.D., formerly Associate Professor of Medicine and recently Director of the Student Health Service of Northwestern University Medical School, Chicago, Ill., has been appointed Dean of the University of Utah School of Medicine, Salt Lake City. HYRUM L. MARSHAL, M.D.,† who has been Acting Dean, will now be enabled to devote full time to his position as Professor of Public Health and Preventive Medicine and Director of the Student Health Service.

\* Fellow, A.P.H.A.

† Member, A.P.H.A.



## Eastern States

MERL G. COLVIN, M.D.,<sup>†</sup> Medical Director of Lycoming County, Pennsylvania, for the past 7 years, has been appointed a member of the State Advisory Health Board.

WILLIAM L. COOK, JR., M.D., has been appointed Assistant Director of the Department of Industrial Hygiene, University of Pittsburgh, Pittsburgh, Pa. Dr. Cook was Assistant Director and later Director of the Occupational Health Division, Office of the Surgeon General, U. S. Army, during World War II.

JOHN FERRELL, M.D.,\* recently Associated with the John and Mary Markle Foundation, New York, has been appointed Adviser and Consultant Executive Secretary of the North Carolina Medical Care Commission. CLEMENT C. CLAY, M.D., resigned as Executive Secretary, several months ago.

FRANKLIN M. FOOTE, M.D.,\* has been appointed Medical Director of the National Society for the Prevention of Blindness, Inc., New York, N. Y. Recently discharged from the Medical Corps of the U. S. Army, with the rank of Major, Dr. Foote retains his post as Assistant Professor of Public Health and Preventive Medicine at Cornell University Medical College. He was formerly associated with the New York City Health Department and the Connecticut State Department of Health. He is the present Chairman of the Committee on Scientific Exhibits for the American Public Health Association.

JOSEPH G. HOFFMAN, Ph.D., physicist, has been named Director of Cancer Research at the Rockwell Park Memorial Institute, Buffalo, N. Y.

RALPH HORTON, M.D.,<sup>†</sup> has been appointed General Director of the

Tuberculosis Hospitals in the New York State Department of Health. Dr. Horton, who is now Director of the Homer Folks State Tuberculosis Hospital at Oneonta, will be responsible for inspection and supervision of all county and city hospitals which will take part in the state-wide program to eliminate tuberculosis in the state within 20 years.

ALFRED C. LABOCCETTA, M.D., has been appointed Superintendent and Medical Director of the Philadelphia Hospital for Contagious Diseases.

MORTON L. LEVIN, M.D., Director of Cancer Control, New York State Department of Health, was elected President of the Public Health Cancer Association at its annual meeting in Cleveland. He succeeds HERBERT L. LOMBARD, M.D.,\* Director of the Division of Cancer and other Chronic Diseases, Massachusetts Department of Public Health.

CHALMER J. LONGSTREET, M.D.,<sup>†</sup> was recently honored with a dinner to mark his retirement after nearly 30 years' service as Health Officer of Binghamton, N. Y.

MARY BLANCHE MOSS has been appointed Medical Social Worker on the staff of the National Society for the Prevention of Blindness, Inc., New York, N. Y. Miss Moss's experience includes supervisory service in the Medical Social Service departments of Charity Hospital, New Orleans, and New Haven Hospital, as well as five years with the Red Cross overseas as supervisor of Medical Social Workers in the European Theatre.

HUGO MUENCH, M.D.,\* a former staff member of the International Health Division of the Rockefeller Foundation, and Professor of Biostatistics in Harvard University's School of Public Health, has been appointed head of the Department of Biostatistics. Dr. Muench is also Assistant Dean.

\* Fellow, A.P.H.A.

† Member, A.P.H.A.

# CHANGES IN NEW YORK STATE DEPARTMENT OF HEALTH:

JOHN K. MILLER, M.D.,† Albany, N. Y., has been appointed Associate Director of the Division of Laboratories and Research, succeeding MARY B. KIRKBRIDE, D.Sc.,\* who retired July 1. Dr. Miller has been associated with the Department since 1937, and since 1942 has served with the Army, most recently in the Mediterranean Theatre as Colonel in the Medical Corps.

J. C. BOLAND, M.D.,† recently Health Officer of the City of Troy, N. Y., has been appointed Deputy County Health Commissioner of the newly organized Rensselaer County Department of Health, which includes the City of Troy.

FRANK E. COUGHLIN, M.D., DR.P.H.,\* formerly New York State Department of Health District State Health Officer, has been appointed County Commissioner of Health in the Rensselaer County Department of Health, Troy, N. Y., effective November 1, 1946.

THEODORE S. DRACHMAN, M.D.,† Assistant District Health Officer, who has been on military leave since June, 1943, has resigned from the department and was appointed to the position of Deputy Commissioner of Health of Westchester County, effective August 13, 1946.

GEORGE JAMES, M.D.,\* formerly Assistant District Health Officer in the Middletown district, has been appointed to the position of District Health Officer and assigned to the Kingston district to replace BERWYN F. MATTISON, M.D.†

EUGENE B. WILSON, M.D., who has been serving in the armed forces for the past two years, has been reinstated as Assistant Director of the Medical Rehabilitation Bureau.

A. J. CANNING, M.D., formerly of Rhoads General Hospital, Utica, was appointed as Director of the New York State Reconstruction Home at West Haverstraw, effective September 1, 1946. KENNETH S. LANDAUER, M.D., who has served as Acting Director since the retirement of the former superintendent, has resigned from the department to accept appointment as Director of Medical Care of the National Foundation for Infantile Paralysis. He will continue to serve as consultant to the New York State Reconstruction Home.

JERAULD A. CAMPBELL, M.D.,† formerly County Health Officer of the Mason-Bracken Health Department, Maysville, Ky., has been appointed Assistant District Health Officer of the Rochester district, effective November 16.

HARRY L. CHANT,\* district State Health Officer in Middletown district, has resigned to accept an appointment as Associate Professor in the Department of Public Health, School of Hygiene and Public Health, Johns Hopkins University, and Director of the Eastern Health District, Baltimore City Health Department.

DOUGLAS POTEAT, former Vice-President of the American Red Cross, has been appointed Administrative Head of the American Cancer Society, New York, N. Y.

OTTO R. POZDENA, M.D., of Woodside, N. Y., has been appointed Acting Registrar and Director of the Bureau of Records, New York City Department of Health.

ELMER H. STOTZ, PH.D., has been appointed Professor of Biochemistry and Chairman of the Department of Biochemistry, University of Rochester School of Medicine and Dentistry, Rochester, N. Y. He will succeed WALTER R. BLOOR, PH.D.

## Southern States

## CHANGES IN HEALTH PERSONNEL IN ALABAMA:

JAMES L. CARPENTER, M.D., of Huntsville, has been appointed Health Commissioner of Madison County.

CLAUDE D. KILLIAN, M.D., of Fort Payne, has resigned as Acting Health Officer of DeKalb County.

GUSTAVE J. DAMMIN, M.D.,† has been appointed Assistant Professor of Internal Medicine and Assistant Professor of Pathology, Washington School of Medicine, St. Louis, Mo. He will serve as Director of the Central Diagnostic Laboratories at Barnes Hospital, St. Louis, and will aid in the teaching of laboratory diagnosis in the Department of Medicine. Dr. DAMMIN has recently been released from military services where he has been in charge of the Laboratory Division in the Office of the Surgeon General.

EVERETT H. ELLINWOOD, M.D.,\* of Raleigh, N. C., has been named Health Officer for the Catawba-Lincoln, N. C., District Health Department succeeding HAROLD C. WHIMS, M.D.,† who holds a similar position in Buncombe County, N. C.

CORNELIUS W. KRUSE, M.S. (sanitary engineering) has been appointed Associate Professor of Sanitary Engineering at the Johns Hopkins School of Hygiene and Public Health, Baltimore, Md.

## CHANGES IN HEALTH PERSONNEL IN MARYLAND:

NELS A. NELSON, M.D.,\* Assistant Professor of Venereal Diseases at the Johns Hopkins University School of Hygiene and Public

Health, Baltimore, has been appointed Director of the Bureau of Venereal Diseases in the Baltimore City Health Department.

HENRY F. BUETTNER, M.D.,† has been named Acting Director of the Bureau of Social Hygiene in the Baltimore City Health Department succeeding HUMPHREY WARREN BUCKLER, M.D.

THOMAS B. TURNER, M.D.,\* Professor of Bacteriology, Johns Hopkins School of Hygiene and Public Health, and ALLEN F. VOSHELL, M.D., Professor of Orthopedic Surgery, University of Maryland School of Medicine and College of Physicians and Surgeons, have been appointed Consultants to the Baltimore Department of Health.

ROBB S. SPRAY, PH.D., has retired as Professor of Bacteriology at the West Virginia University School of Medicine, Morgantown, where he has been a member of the faculty for twenty-five years. He has been named Professor Emeritus. JOHN M. SLACK, PH.D., who has been in the Sanitary Corps of the U. S. Army for the past 4 years, has been named to fill the vacancy.

FRED WAMPLER, M.D.,\* of Richmond, Va., has been named Director of the Page-Warren-Shenandoah Health District, Virginia State Department of Health, effective September 1.

GIDEON D. WILLIAMS, M.D., has been appointed Director of the Ouachita Parish Health Center, Monroe, La. He has been serving in a similar capacity with the East Baton Rouge Parish Health Center.

JOHN B. YOUMANS, M.D., has been appointed Dean of the University of Illinois College of Medicine, Chicago. He has been Professor of Medicine at Vanderbilt University School of Medicine, Nashville, Tenn.

\* Fellow, A.P.H.A.  
† Member, A.P.H.A.

### Western States

JOHN W. BROWN, M.D., Director of Clinical Laboratories, University of California Hospital, and Assistant Professor of Medicine, University of California Medical School, San Francisco, has been appointed Professor of Preventive Medicine and Director of the Department of Student Health at the University of Wisconsin Medical School, Madison. Dr. Brown will utilize the Student Health Service as a demonstration unit for closer correlation of clinical practices with preventive medicine in the broader field of public health.

#### CHANGES IN HEALTH PERSONNEL IN CALIFORNIA:

KENNETH W. HAWORTH, M.D., formerly of Pratt, Kan., has been appointed Health Officer for Humboldt County.

EVELYN F. BUCHHEIM, M.D.,† for the past 2 years district Medical Officer for the Fresno area, California Department of Public Health, has resigned.

HAROLD T. CASTBERG, M.D.,\* has resigned as Chief of the Bureau of Adult Health to become Director of Field Investigations for the U. S. Public Health Service, Industrial Hygiene Division, Bethesda, Md.

LESTER BRESLOW, M.D.,† is Acting Chief of the Bureau of Adult Health.

MARY B. DALE, M.D.,† has been appointed Epidemiologist for the Los Angeles, Calif., County Health Department. Newspapers report that she is the first woman to hold such a position in the county.

ALFRED ROE MASTEN, M.D., has been appointed Director of the Tuberculosis Control Section of the Oregon State Board of Health. Dr. Masten

has been Director of Tuberculosis Control for the Colorado State Board of Health, Denver.

FRANK B. QUEEN, M.D., has been appointed Professor of Pathology at the University of Oregon Medical School, Portland, Ore., and Director of the State Cancer Control Program. As Director of the Cancer Program he will serve under the joint auspices of the Medical School and the Oregon Division of the American Cancer Society.

PHINEAS J. SPARER, M.D.,† who recently joined the staff of the Jewish Consumptives' Relief Society as Medical Director has been named Superintendent of that Sanatorium in Denver, Colo. Dr. Sparer came to the Sanatorium from the U. S. Army after 3 years with the Tuberculosis Service at Fitzsimons General Hospital, Denver, Colo.

### Puerto Rico

JUAN A. PONS, M.D., Puerto Rican physician, has been appointed Commissioner of Health of Puerto Rico to succeed ANTONIO FERNÓS-ISERN, M.D.,\* now resident commissioner of Puerto Rico in Washington, D. C.

### Foreign

DAGMAR JOHNSON, R.N.,† nursing representative with American National Red Cross Civilian Relief, has returned from Europe and joined the National Red Cross nursing staff in this country. Miss Johnson served with the Public Health Section of the Allied Military Government in Germany, working with displaced persons. Going from Germany to Holland, Miss Johnson worked in coöperation with the Medical Section of the Dutch Red Cross in hospital and public health activities. She later moved on to the Scandinavian countries, where she worked

Completely Revised Edition

# The Money Value of A Man

By

**LOUIS I. DUBLIN, Ph.D.**

*Second Vice President and Statistician; and*

**ALFRED J. LOTKA, D.Sc.**

*Assistant Statistician, Metropolitan Life Insurance Company*

THIS BOOK has long been accepted as a standard guide for determining the money values of persons at various ages according to their earnings. In this newly revised edition extensive recomputations have been made in the tables to conform to altered conditions, resulting largely from lowered interest rates and increased expectancy of life. Also, the structure of the final tables showing the money value of a man by age and income has been remodeled, with definite advantage to the user.

It will be of specific value not only to health officers and social workers interested in the costliness of disease and premature death, but also to insurance officers and agents, lawyers, jurists, statisticians and economists.

## ==OUTLINE OF CONTENTS==

Historical Retrospect. The American Family. Cost of Bringing Up a Child. Income in Relation to Age and Economic Status. Money Value of a Man as a Wage Earner. Burden of the Handicapped. Valuation of Indemnity for Personal Injury or Death.

Disease and the Depreciation of the Money Value of a Man. Application to Public Health. Application to Life Insurance. Social Insurance in Relation to the Money Value of a Man. Age Schedules of Family Consumption Units and Savings. Effect, Upon Money Values, of Changes in Basic Data. *Tables and Charts.*

Price \$6.00

**THE RONALD PRESS COMPANY**  
15 East 26th Street New York 10, N. Y.

Please send me a copy of THE MONEY VALUE OF A MAN, by Drs. Dublin and Lotka. Price \$5.00. 14-157

☐ Check Enclosed ☐ Bill Me

(we pay postage if you remit with order)

Name \_\_\_\_\_

Firm \_\_\_\_\_ Position \_\_\_\_\_

Business Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

with the League of Red Cross Societies, giving assistance in public health needs and assisting in strengthening the general nursing programs.

## CONFERENCES AND DATES

American Association of School Administrators. Atlantic City, N. J., March 1-6.

American Dietetic Association. San Francisco, Calif. October 13-17.

American Hospital Association. Annual Convention. St. Louis, Mo. September 22-25.

American Medical Association—43rd Annual Congress on Medical Education and Licensure. Palmer House, Chicago, Ill. February 10-11.

American Public Health Association—75th Annual Meeting. Atlantic City, N. J. Week of September 22.

American Society of Heating and Ventilating Engineers—7th International Heating and Ventilating Exposition. Lakeside Hall, Cleveland, Ohio, January 27-31.

American Water Works Association Annual Convention—San Francisco, Calif. Week of July 21-25.

Illinois Section—Congress Hotel, Chicago, Ill. April 17-18.

Minnesota Section—Lowry Hotel, St. Paul, Minn. March 13-15.

Montana Section—Havre, Mont. April 25-26.

New York Section—Annual Midwinter Luncheon Meeting. Hotel Commodore, New York, N. Y. January 17 (12:30 p.m.).

New York Section—Hotel Statler, Buffalo, N. Y. April 10-11.

Antibiotics Study Section, National Institute of Health, Washington, D. C. January 31-February 1.

Child Study Association of America. Annual Conference. Hotel Roosevelt, New York, N. Y. March 10.

Federation of Sewage Works Associations. San Francisco, Calif. July 22-24.

Interstate Post Graduate Medical Association of North Carolina. Public Auditorium, St. Louis, Mo. October 13-17.

National Dairy Council. Atlantic City, N. J. January 29-31.

Texas Public Health Association. Annual Meeting. Baker Hotel, Dallas, Tex. February 23-26.

The New York State Industrial Nurses Second Annual Conference. Pennsylvania Hotel, New York, N. Y. March 1-2.

# American Journal of Public Health

## and THE NATION'S HEALTH

---

Volume 37

February, 1947

Number 2

## Brucellosis in the United States\*

ALICE C. EVANS

*National Institute of Health, Bethesda, Md.*

### THE ORIGINS OF BRUCELLOSIS IN THE UNITED STATES

*The earliest human cases*—In 1906 the first report of a case of brucellosis contracted in this country was published by Craig. Having seen other cases in this country among soldiers who had become infected in the Philippines, he recognized the disease in a nurse who, it was believed, had contracted the infection in Washington, D. C. Because at that time the belief prevailed that brucellosis did not exist in temperate climates, it was supposed that the patient must have contracted the infection while carrying on her work of caring for returned soldiers in hospitals. That explanation is hardly satisfactory now, for we know the unlikelihood of transmission of the disease from person to person. Furthermore, the nurse had never taken care of a recognized case of brucellosis.

In 1911 Ferenbaugh, and Gentry and Ferenbaugh reported 12 cases of brucellosis which they had seen that year in the goat-raising section of southwestern

Texas. Ten of the patients were goatherds or ranchmen who worked with goats and lived in houses surrounded by them; two were boys who had often played in dusty goat-pens. Some of the patients had never drunk goat's milk.

On inquiry the investigators learned that similar cases had occurred in that locality for a long time, and that it was known among the people by various names, such as "goat fever" and "dust fever." The doctors of the region had realized that in many respects the fever was different from typhoid. In 1894 there had been an outbreak of 25 cases in one locality, occurring almost entirely in families that had goat-pens closely surrounding their houses.

In 1923 Holt and Reynolds studied the serologic evidence of brucellar infection of goats in the Southwest. From local laymen they learned of a human disease which was apparently brucellosis. Their inquiries led them to believe that it must have existed in that locality for at least 40 years.

According to Gentry and Ferenbaugh (1911) the goats of Texas are descended from goats imported from four countries—Spain, Malta, Asia Minor, and South

---

\* Special Review Article prepared at the request of the Editorial Board. Read before the First Inter-American Congress for Brucellosis, in Mexico, D. F., October 28, 1946.

Africa. That brucellosis is prevalent in the goats of the Mediterranean countries is common knowledge, and Gentry and Ferenbaugh quote South African investigators who proved that the disease existed in that country. Hence it may be assumed that the date of the first arrival of goats in Texas was followed shortly by cases of human brucellosis.

*The first appearance of the disease in cattle*—Brucellosis is known to have existed in the cattle of this country for more than a century. It is the subject of repeated discussion in the tenth volume of *The Cultivator*, published in Albany, N. Y., in 1843, edited by Gaylord and Taylor. At that early date many losses due to this bovine disease were reported from New York, Pennsylvania, Delaware, and Virginia.

Brucellosis may have been brought to this country in cattle very early, for according to Edwards (1921) it existed in the cattle of Great Britain before the settlement of the American Colonies. This author quotes Mascal, who wrote in 1567 that in some parts of Great Britain 50 to 60 per cent of the cows were "slipping" their calves.

The extent to which the bovine disease was transmitted to man prior to its recognition during recent decades can never be known. If the human disease were always as widely prevalent as it is today, it seems as if its derivation from cattle would have been suspected. It may be that the bovine strains of earlier times were of comparatively mild virulence for man, and that human infection occurred only rarely. The records of brucellar strains spreading through animal species which hitherto had been unaffected, as presented in the following pages, permits the supposition that man may have been relatively insusceptible to the strains of brucella which infected the cattle of this country a century ago.

However, Hardy, *et al.* (1930) were

convinced that brucellosis was the protracted fever which was described during the latter part of the 19th century by a number of authors. Caulkins (1878), a doctor in rural Southeastern Michigan, wrote that a mild type of fever which differed from typhoid fever and malaria was first noted in certain sections of the country about 1861. He reported cases in which the symptoms were typical of acute brucellosis.

*The first appearance of the disease in swine*—Unlike the histories of brucellosis in goats and cattle, the history of the disease in the swine of this country is definite, for it began somewhat more than 30 years ago. In 1914 Traum published the statement that reports of the farrowing of hairless and immature pigs had been received by the United States Department of Agriculture from several of the western and middlewestern states. From the liver and other organs of a hairless pig received from Indiana, he obtained a culture which resembled the organism of contagious abortion of cattle. Two years later Good and Smith reported their study of the porcine disease and its causal agent in Kentucky. They stated that only three outbreaks had come to their attention. In 1920 Hayes and Traum reported that infectious abortion was becoming increasingly prevalent in the sows of California. They estimated that it might be present in 9 per cent of the herds of that state. In 1930 Hardy, *et al.* reported that of the 611 hogs which they examined in Iowa, 18 per cent gave serological evidence, and an additional 16 per cent gave doubtful evidence of infection. In the preceding year Theobald Smith reported that he had obtained cultures of the organism of contagious abortion from porcine fetuses in an outbreak which he believed was the first reported in the eastern part of the United States. According to Stone (1943) the hogs of New York State were free of brucellosis until 1941.

## INVESTIGATIONS

When the scene of brucellar investigations shifted from European countries to the United States, about 1910, it was known that the human disease, called undulant, Malta, or Mediterranean fever, is prevalent in Mediterranean countries; that it is contracted by means of contact with infected goats, which, even when apparently in good health, excrete the causal organism, *Micrococcus melitensis*, in the milk and urine. From Mediterranean countries the disease was known to have spread to other subtropical regions, carried by exported goats.

Another fact known at that time, but entirely disconnected with the knowledge about "undulant fever" was that contagious abortion of cattle is due to an infection of the cow with an organism designated *Bacillus abortus*, which was discovered in 1897 by a Danish veterinarian named Bang.

The first publication to appear in this country on the causal organism of brucellosis in domestic animals was a confirmation of Bang's observation, by MacNeal and Kerr, in 1910. In the following year an important discovery was made by investigators of the Bureau of Animal Industry, United States Department of Agriculture. Schroeder and Cotton reported that they found the organism of contagious abortion in milk derived from apparently healthy cows. In that same year, Mohler and Traum examined the tonsils removed from 56 children, and succeeded in isolating the organism of contagious abortion from one. In commenting on these discoveries, Dr. Melvin, Chief of the Bureau of Animal Industry, made a prophetic statement: "The fact that this organism was found in 8 samples of market milk among 77 samples tested (over 11 per cent) and in the milk distributed by 6 among 31 dairies (over 19 per cent) leaves no doubt that we are dealing with a phenomenon that is

ominously serious in its significance for public health."

Into the Dairy Division\* of the Bureau of Animal Industry the writer came, and was assigned the task of studying the bacteria which occur in freshly drawn milk, that is, the bacteria which grow within the cow's udder and are excreted in the milk. Because the pathologists of the Bureau were deeply involved in investigations of Bang's disease, it was quite natural that the Gram-negative organisms which the Chief had "viewed with alarm" should become the object of keen interest to the dairy bacteriologist. Discussions with the pathologists were frequent and searching. One day in 1917 in a conversation with Dr. Adolph Eichhorn the idea evolved that it might be worth while to compare Bang's "*Bacillus abortus*" with the so-called "*Micrococcus melitensis*." It was the fact that both organisms were known to be excreted in the milk of apparently healthy animals that suggested their comparison.

Whose idea was it? It was one that neither the bacteriologist nor the pathologist could have formulated in solitary cogitation at that time. It developed when two minds, viewing the subject from different angles, were reciprocally stimulated in the search for facts bearing on related problems.

Immediately the bacteriologist set up simple experiments to test the idea, and with amazement noted that one result after another pointed to a close relationship between the strains of supposedly different genera. They were alike in morphology, in staining reactions, and in biochemical reactions. They were alike culturally, except that the strains of caprine and human origins produced a brownish discoloration of the medium after long incubation. They appeared alike when tested in an anti-

---

\* Now designated the Bureau of Dairy Industry.



serum produced by a strain of bovine origin, for this serum agglutinated strains of bovine and human origin in equal titer. An antiserum produced by a strain of human origin also agglutinated antigens of both types, but the titer was somewhat higher when tested with antigen prepared with a strain of human or caprine origin. Pregnant guinea pigs inoculated with a strain of human origin aborted with the same degree of promptness as did those inoculated with a strain of bovine origin. Of all the tests applied at that time, that of agglutinin-absorption was the only one which could distinguish the strains of different origin.

As the older bacteriologists will remember, these findings, which were reported at the annual meeting of the Society of American Bacteriologists, held in Washington, D. C., in December, 1917, encountered skepticism when they were published in July, 1918. The only reason which the writer ever heard given to account for their tardy acceptance was that if there was a close relationship between the two supposed genera, other bacteriologists would have noted it. Although the accuracy of some of the statements in question could have been confirmed in a few hours, one distinguished bacteriologist continued for seven years to deplore the confusion caused by what he considered hasty publication. Even the writer's colleagues, the pathologists of the Bureau of Animal Industry, did not believe that the results could have been accurate. This statement was confirmed recently by one of them\* who at the time was one of the younger members of the staff.

The skepticism ought to have been dispelled earlier than it was, because the original observation of a close relationship between the organisms of bovine

contagious abortion and human "undulant fever" was confirmed by Meyer and Shaw in 1920, and by 10 other investigators in 7 foreign countries within the next four years. (This literature was reviewed by the writer in an earlier publication [1925].)

The close relationship between the two organisms raised a question as to why no cases of disease were ever traced to cattle. There was no satisfactory answer for a number of years. We could only ask: "Are we sure that cases of glandular disease, or cases of abortion, or possibly diseases of the respiratory tract may not sometimes occur among human subjects in this country as a result of drinking raw cow's milk?" (Evans, 1918.)

*Human cases of proved brucellar infection*—The beginning of an answer came in the fall of 1922, when a culture was received from Dr. Harold L. Amoss of the Johns Hopkins Hospital. It had been isolated from the blood of a patient with the symptoms of undulant fever who denied having had any association with goats or their products. The culture came with the request that it be studied to determine whether it was *Micrococcus melitensis* or *Bacillus abortus*. According to the agglutinin-absorption test, the culture was unquestionably not of the caprine type.

This case, which was reported by Keefer (1924) was the first to be reported in medical annals in which brucella not of caprine origin were proved to be the cause of human disease. Later information revealed that the patient had contracted the disease from tissues obtained from a slaughter house. As an assistant in the histological laboratory of Johns Hopkins Medical School, he went frequently to a slaughter house to obtain tissues for purposes of teaching. Subsequent studies showed that his infection was with the porcine type of the organism, and that the mode of his infection, which resulted

---

\* Dr. Harry Schoenig, in a discussion at a meeting of the Bacteriological Seminar, University of Maryland, June 7, 1945

from the handling of infected hogs or their carcasses, is typical of a large percentage of cases occurring in this country.

The finding of one human case of brucellosis due to the organism of contagious abortion stimulated a prompt search for others. The writer collected the remnants of samples of serum obtained routinely in Washington hospitals for the Wassermann test, and tested them for brucellar agglutinins. Among 500 samples, one serum gave a strongly positive reaction, and two gave positive reactions in the dilution of 1 to 40 (Evans, 1924). At that time we did not know how to interpret such a low reaction. We know now that it may be suggestive of infection (Evans, Robinson, and Baumgartner, 1938). In the case of the strongly positive reaction, the doctor in charge made a diagnosis of brucellosis, for the history and symptoms agreed with that disease. The patient, who lived in Clarendon, Va., stated that he drank raw cow's milk habitually, but that he had never consumed goat's milk or any of its products. Agglutinin-absorption tests made on his blood serum indicated that the infection was of the bovine type. This second case of brucellosis caused by the organism of contagious abortion was recognized in March, 1923. The clinical history of this case was not reported, but the laboratory findings were reported (Evans, 1924).

Keefer's report of the first recognized case of brucellosis in this country not of caprine origin is frequently mentioned in the literature. The order of sequence of the third, fourth, and fifth cases is established by the dates on which cultures were sent to the writer for identification, and it is confirmed by the dates given in the published reports. The dates of publication of the reports follow one another in a different order.

The third case was reported by Gage and Gregory (1926). A culture ob-

tained from the blood was received in May, 1924. Agglutinin-absorption tests showed that it was not of caprine origin. The patient, whose job was the killing of hogs, had worked for five years in a slaughterhouse in Sioux Falls, S. D.

Also the history of the fourth case, which was reported by Knowlton (1925) indicated that the infection was contracted from hogs in a slaughterhouse. A blood culture was received by the writer in August, 1924. Agglutinin-absorption tests showed that it was not of caprine origin.

A blood culture from the fifth case, which was reported by Carpenter and Merriam (1926) was received in February, 1925. Agglutinin-absorption tests showed that it was not of caprine origin. In this case, which occurred in Ithaca, N. Y., the history pointed to cow's milk as the source of the infection.

*Human cases are recognized in South Africa also*—Almost simultaneous with these events in this country was the recognition of brucellosis in South Africa in cases in which goats could not be implicated. According to the veterinarian, Bevan (1933), after he had read, in 1921, of the relationship between the causal organisms of Bang's disease and undulant fever, it occurred to him that certain hospitalized patients of his acquaintance might be infected with the bovine type of the organism. The results of agglutinative reactions strengthened that supposition, and in November, 1921, he reported at a meeting of the Southern Rhodesian Veterinary Association that he had tested the blood of a patient, and obtained a rapid and marked agglutination with Bang's organism in dilutions as high as 1:200. This seems to have been the first reported observation anywhere in the world of evidence of human infection with Bang's organism. The report was published in January, 1922. It mentions other human cases which were detected in a certain district "within the

last few months." In 1924 Bevan wrote that cases similar to the one mentioned in his earlier publication continued to occur. In 1925 he wrote that 35 cases of undulant fever had been recognized in persons in Southern Rhodesia who could not have been infected from goats. At that time only 5 such cases had been recognized in the United States.

Working in the same area with Bevan was the bacteriologist Orpen. In 1923 he described the method by which he obtained brucella from Rhodesian patients with undulant fever. By agglutinin-absorption tests he identified these strains with the bovine type of the organism (1924). Orpen does not give the date when he first obtained cultures of brucella from patients. Hence it cannot be stated whether this proof of human infection of bovine origin antedated the cultivation of brucella from the Baltimore case.

*Many cases of brucellosis are found—* Following these observations an occasional human case of brucellosis of other than caprine origin was recognized here and there in the United States and in other parts of the world. Usually the recognition of one case aroused interest, which resulted in finding other cases in the neighborhood. In April, 1925, an editorial appeared in the *Journal of the American Medical Association* calling the attention of physicians to the existence of brucellosis in parts of the United States where it was hitherto unsuspected. Probably as a result of this editorial, recognition of cases became more frequent. By the end of 1926, data were available on 20 cases from which a sample of serum and/or a culture was sent to the writer for study. These were examined by means of the agglutinin absorption test, and the result indicated the type of infection. A report of the findings was published in the *Journal of the American Medical Association* in February, 1927.

Then the number of recognized cases

began to multiply by leaps and bounds. In 1927, 217 cases were reported in *Public Health Reports*; in 1928, 649 cases; in 1929, 1,301 cases; in 1934, about 2,000 cases; in 1938, more than 4,000 cases. Since then, there has been no increase in the number reported. The discrepancy between the actual number and the reported number is discussed further on.

#### NOMENCLATURE

Nomenclature has played the mischief with brucellosis. Familiar names which suggested erroneous ideas made impressions so deep that they could hardly be obliterated by contrary facts. The two generic names, *Micrococcus*, implying a spherical form of the causal organism of "Malta fever" and *Bacillus*, implying an elongated form of the causal organism of contagious abortion, prevented their comparison until twenty years had passed after Bang's discovery. The names "Malta fever" and "Mediterranean fever" suggested a limited distribution of the disease, and this helped to prevent its recognition in other parts of the world. The name "undulant fever," suggesting that in every case there must be a significant rise of temperature tracing an undulating curve, exerts an influence now against the recognition of the chronic disease.

Some of the unfortunate names have been dropped. When Meyer and Shaw (1920) confirmed the close relationship between strains of caprine and bovine origin, they suggested for this group of organisms the generic name *Brucella*, derived from Bruce, the name of the Englishman who first cultivated the organism from a human case on the island of Malta. This name was accepted, and it is now used in all scientific publications.

The disease is now correctly called brucellosis, a satisfactory name which identifies brucella infection in any of its manifold manifestations in man or ani-

mals. The writer was unable to find the first use of the term "brucellosis," but in 1930 Hasseltine stated that the synonymous terms "brucellosis" and "brucelliasis," signifying the state of being infected with *Brucella*, had recently appeared in the literature, and that the latter term was preferred by classical scholars. Both of these names were used frequently until 1934, when Giltner published a monograph on "brucellosis." In a footnote he explained that "brucellosis" is preferable to "brucelliasis" because the ending *iasis* is used commonly for names of diseases due to protozoan infections, whereas *osis* is used commonly for names of diseases due to vegetable pathogens.

"Brucellosis" is gradually replacing other names, although "undulant fever" still appears in official records in this country. If it should be discarded, that would help to clear the way toward a recognition of the chronic disease.

#### THE SPECIES OF BRUCELLA

When the close relationship between the causal organisms of "undulant fever" and contagious abortion of cattle was first recognized, the only available test which could distinguish the bovine from the caprine type was the agglutinin-absorption test, which does not distinguish strains of bovine and porcine origins. Later, other tests were devised which enable that distinction to be made, the most practical being the bacteriostatic tests devised by Huddleson.

For the sake of convenience, the various types of *Brucella* have been given specific names. There are three species, *melitensis*, *abortus*, and *suis*. Actually, in the opinion of the writer, they are too closely related to justify the recognition of three species. They differ, however, enough to justify varietal distinctions.

Because trinomials are awkward, recognition of the distinctions as varietal

was not acceptable to the taxonomists.

*Susceptibilities of host species*—The present incomplete knowledge of susceptibilities to brucellar infection of man and those species of domestic animals in which infection is known to be widespread may be outlined as follows:

Species	Primary Host	Secondary Hosts
<i>B. abortus</i>	cattle	man horse
<i>B. suis</i>	swine	man cattle
<i>B. melitensis</i>	goats (sheep)	man cattle swine

Information is limited on transmission from animal to animal in other than the primary host species. However, a few facts are known.

Although cattle are susceptible to infection with *B. suis*, swine are insusceptible to infection with *B. abortus*. This explains why the disease can exist in the cattle of localities where the porcine disease is nonexistent.

We do not hear of human cases resulting from contact with horses, and this suggests that the infection may not be readily transmitted from the equine to the human subject. A number of investigators (Fitch and Dodge, 1939; Stone, 1941; and others) believe that the disease is transmissible from horses to cattle.

Cattle infected with *B. melitensis* or *B. suis* transmit these organisms to man through the milk. They are more virulent for man than is *B. abortus*, and apparently they do not lose virulence for man on passage through the cow.

Infection of cattle with *B. melitensis* has extended to regions remote from the goat raising country of the Southwest. In 1934 Carpenter and Boak reported that among 122 samples of raw milk from 3 counties in Central New York, brucella were found in 25 samples, and 3 of the strains were proved to be *B.*

*melitensis*. They came from herds in 3 widely separated localities.

According to data published by Jordan and Borts (1946) it appears that the earliest infections of the swine of this country with *B. melitensis* are of recent occurrence. The first culture of *B. melitensis* from a human case in which the infection was contracted from swine in Iowa was obtained in December, 1943. Since then many cultures of *B. melitensis* have been obtained from human cases in packinghouse workers and farmers. The data suggest that in most of these cases the infection was derived from swine.

The relative percentages of the three brucellar species in the human infections of any locality depend largely on the extent of the development of the hog-raising and/or goat-raising industries. The two following surveys were made in middlewestern states, where the hogs are commonly infected. Kabler and MacLanahan (1936) studied 38 strains which came to the laboratories of the Minnesota Department of Health. Twenty-four were *B. suis*, 12 were *B. abortus*, and 2 could not be satisfactorily classified. Jordan and Borts (1946) reported the distribution of species among 339 strains isolated from the blood in cases of the human disease and studied at Iowa Department of Health from July, 1927, to June, 1945. The distribution was as follows: 67.3 per cent *B. suis*; 24.5 per cent *B. abortus*; 7.7 per cent *B. melitensis*; 0.5 per cent unidentified. That *B. suis* has spread to states where the raising of hogs is not a well developed industry is shown by the data reported from Alabama which were published by Hutchings (1944). Among the cultures from 91 human cases occurring in that state, 69, or 75.8 per cent, were *B. suis*.

Human infections with *B. abortus* tend to be sporadic; those caused by *B. melitensis* and *B. suis* ingested in raw milk are more apt to occur in groups.

In this country many of the outbreaks of human brucellosis traced to cattle have been caused by *B. suis* in raw milk. An outbreak of 11 cases occurred in Georgia in 1929 (Atwood and Hasseltine); one of 30 cases occurred in Iowa in 1933 (Beattie and Rice); one of 14 cases with 3 deaths occurred in a home for elderly persons in Connecticut in 1934-1935 (Horning); one in which 77 persons gave evidence of infection occurred in Iowa in 1941 (Borts, *et al.*).

In 1922 an outbreak of 37 definite and additional suspected cases of brucellosis caused by *B. melitensis* occurred in Arizona. There were two deaths of patients in whom the brucellar infection was superimposed on other chronic disease. In 32 cases the source of the infection was traced to goat's milk (Watkins and Lake, 1927).

#### THE PREVALENCE OF BRUCELLOSIS

The prevalence of brucellosis in man depends on its prevalence in animals. Hence it is predominantly a rural disease.

*Prevalence of brucellosis in cattle*—On July 1, 1934, the U. S. Department of Agriculture initiated a campaign for the eradication of the disease from cattle which has been carried on in every state. The criterion of infection is a positive agglutinative reaction of the specific organism in the cow's serum in a titer of 1:100. Reacting animals are slaughtered, and the owner receives partial indemnity. During the first ten years of the campaign about 65,000,000 cattle were tested; more than 2,500,000 were found to be reactors, and were slaughtered. During the first year of the campaign about 10 per cent of cattle reacted to the test, involving 40 per cent of the herds that were tested. The fact that ten years later only about 4.5 per cent of reactors were found attests the success of the campaign in reducing the number of infected cattle.

*Prevalence of brucellosis in other*

*animals*—Extensive data comparable to those relating to cattle are unavailable for estimation of the prevalence of brucellosis in other animals. However, limited surveys have been made.

The incidence of brucellosis in swine differs in various parts of the country, being highest in the hog raising states of the Middlewest. Likewise, the incidence of brucellosis in goats is unevenly distributed, being highest in the goat raising states of the Southwest. Holt and Reynolds (1925) found serological evidence of infection in 16.7 per cent of 1,130 goats examined in 22 counties along the Mexican border. Recently Stiles (1945) examined the blood serum of 14,339 animals representing 131 herds in southwestern Colorado, and found evidence of infection in 8.5 per cent of them.

That brucellar infection is common in the horses of this country was shown by several investigators, including Carpenter and Boak (1937) in New York State, and Deem (1937) in Ohio. These investigators found a positive agglutination reaction in a high percentage of cases of fistula of the withers and poll evil, and in a considerable percentage of horses which appeared normal.

Although brucellar infection of sheep exists in France and in other Mediterranean countries, the disease is almost unknown in the sheep of this country. However, it has begun to make its appearance here. Bruce (1930) reported that he had cultivated brucella from a dead lamb received in February, 1927, from Vancouver Island. It came from a flock in which some trouble with lambing had occurred. Apparently the culture was not studied to determine the species of *Brucella*. Bruce believed that this was the first report in North America of brucellar infection of sheep. Jordan and Borts (1946) believe that the recent introduction into Iowa of *B. melitensis* infection of swine was through sheep imported from western and

southern sections of this country. They report one human case of *B. melitensis* infection in which the patient had contact with no animals other than sheep.

A few cases of brucellar infection in dogs have been reported in this country, and the possibility of human infection from dogs is shown by several reports of the transmission of the disease from dogs to man in foreign countries (Dargein and Plazy; Menzani; Mühlenbeck).

Brucellar infection of domestic fowl is reviewed by Huddleson (1943). Little is known, however, of its significance as a source of infection of domestic animals. Infection of rodents, and the possibility that they may serve as a reservoir of infection of domestic animals has been considered by many investigators in foreign countries, and by Fitch and Bishop (1938) in this country. Katz (1941) reviewed the literature on brucellosis in various species of wild animals and discussed the possibility that they may serve as a source of perpetuation of the disease in domestic animals.

*The prevalence of brucellosis in man*—Approximately 4,000 cases of human brucellosis are reported annually to the state departments of health, and the data are summarized in *Public Health Reports*.

The reported disease, designated "undulant fever," includes acute cases with an undulating temperature curve. It would be impossible to estimate how nearly the reported figure approximates the actual number of such cases, for according to Hughes (1897) and numerous subsequent authors, diagnosis is difficult, even in acute cases. No doubt many acute cases are being missed.

The chronic form of brucellosis is extremely difficult to diagnose. The following lines of evidence indicate, however, that an unrecognized mild form of brucellosis is a common ailment in this country: First, the disease has a

tendency to become chronic in every species of domestic animal in which it has been studied. Second, in many human cases in which the correct diagnosis is finally attained it is only after years of poor health for which no cause could be found. Third, many physicians have found numerous cases after they became aware that there is a chronic form of the disease.

#### CHRONIC BRUCELLOSIS

*A mild form of brucellosis in domestic animals*—A general understanding of the course of brucellosis is available without experimentation, for the disease as it occurs spontaneously in domestic animals is known to veterinarians. Its most important feature is the common failure of complete recovery. Every farmer knows the depreciated value of a cow, horse, or hog which has contracted this disease. According to Wight, who has charge of the program of eradication, only one-third to one-half of the cows which become infected with brucella ever recover fully.

In other animals also, brucellar infection is apt to occur in a mild, chronic form, with no obvious signs of disease. Polding (1940) found evidence of latent localized infections persisting in goats for several years following acute infection. Several investigators (Hardy, *et al.*, 1930; Feldman and Olson, 1934; McNutt, 1934) noted that brucella may exist in the tissues of apparently healthy swine. Rice (1944) stated that the exhibition at state and county fairs of infected swine, which appear healthy, is a means of dissemination of the porcine disease. Carpenter and Boak (1937) tested the blood serum of a group of mares repeatedly during a period of two years and found evidence that some of them had become infected without presenting clinical evidence of disease.

*A mild form of brucellosis in man*—Bearing in mind the tendency of brucellosis to become chronic in various

species of animals which appear healthy in spite of infection, it should be expected that in man also the disease would have a tendency to become chronic. In man, a mild form of brucellosis does occur without obvious signs of disease. It generally fails to be recognized because characteristic signs are lacking and laboratory diagnostic techniques are inadequate.

The following experience, beginning more than twenty years ago, when human brucellosis was almost unknown in this part of the world, is typical of that of many patients at the present time, as revealed in letters requesting information on brucellosis which come to the National Institute of Health. Similar cases are described repeatedly in the growing literature on chronic brucellosis.

In October, 1922, the writer became infected while working on cultures of *Brucella melitensis* received from Phoenix, Ariz. For the first nine months the disease was mild. Medical aid was sought, and after examinations failed to reveal any cause for complaint, a diagnosis of "neurasthenia" was received. Then came an acute exacerbation of typical "undulant fever," so diagnosed when a culture of brucella was obtained from the blood. Then five years of poor health, with complete incapacitation much of the time. Again, medical aid was sought in four successive hospitals. The outcome was always the same, the patient was regarded as "neurasthenic." Finally the impasse was broken by the intervention of another disease which necessitated an operation, during which brucellar lesions were found, from which *B. melitensis* was cultivated. Thus accidentally, at last, came relief from the misunderstandings which must inevitably arise when a patient is said to be suffering from imaginary ills. These misunderstandings are a feature of chronic brucellosis that tries the patient almost beyond endurance.

*The literature on chronic brucellosis*—The first paper on chronic brucellosis to be published in this country appeared in 1934 (Evans). Since then, numerous authors have discussed the subject (Cameron and Wells, 1934; Angle, 1935; Goldfain, 1938; Roberts and Roberts, 1939; Calder, 1939; Robinson and Evans, 1939; Angle and Algie, 1939; McGinty and Gambrell, 1939; Dustin and Weyler, 1940; Harris, 1941; Goss, 1941; Simpson, 1941; Holbrook, 1942; Manchester, 1942; Hartsock, 1942; Davis, 1942; Urschel, 1943; Griggs, 1943; Schmidt, 1943; Lehr, 1944; Staub, 1944; Chuinard, 1944; Rice, 1944; Benning, 1946). All are convinced that chronic brucellosis is a common disease. Most of them comment on the frequency of the diagnosis of neurasthenia.

*Estimations of the incidence of chronic brucellosis*—Obviously, estimations of the prevalence of a disease which is so difficult to diagnose as is chronic brucellosis can be only grossly approximate. It seems worth while, however, to record such estimations as can be made.

In 1936, a survey was made of the incidence of chronic brucellosis in Charlotte, N. C. (Robinson and Evans). At the time of the investigation, this city of about 92,000 inhabitants was supplied with raw milk, although many of the herds of cattle in the neighborhood were known to be infected with Bang's disease. Dr. Robinson, who conducted the investigation lasting six months, requested the local physicians to permit him to coöperate with them in studying cases of obscure chronic disease, and he received their generous coöperation.

Although the survey could not cover the entire population of Charlotte, 325 cases of chronic disease were investigated, and among them 22 were regarded as probably chronic brucellosis. In some of the cases this diagnosis was con-

firmed by a positive agglutinative reaction. In 5 cases, blood cultures confirmed the diagnosis.

Considering these results, it would appear to be a conservative estimate to assume that there were at least 25 cases of chronic brucellosis in Charlotte at the time of the survey. If the incidence of the chronic disease in the entire rural population of the United States of approximately 57,000,000 resembles the incidence in Charlotte at the time of the survey, there would be about 35,000 cases in the entire country.

A similar figure is obtained if an estimation is based on the data reported by Lehr (1944). He found that two physicians of St. Clair County, Illinois, who had established a reputation for skill in the diagnosis of brucellosis, together had diagnosed about 100 cases during a period of 2½ years, although they had reported only 2. Lehr studied 24 of their cases, and reported that most of the patients had suffered from ill health for 1 to 4 years before coming under the care of a physician.

All of the 100 cases considered by Lehr were from the rural area of St. Clair County, Illinois, with a population of about 70,000. (The urban population of the county was not considered in these figures because it was protected by an ordinance which required pasteurization of milk.) At the rate of 40 cases per year in an area with a rural population of about 70,000, about 33,000 cases would occur each year in the rural areas of the entire country.

Again, a somewhat similar figure is obtained in an estimation based on a statement made by Gilbert and Coleman (1934). They doubted whether more than one-tenth of the cases that occur in New York State are recognized. It happens that in Italy also, an investigator (Alessandrini, 1938) held the opinion that the number of reported cases should be multiplied by ten, at least, to represent the actual number.



At that rate, the three or four thousand cases reported annually in *Public Health Reports* would represent 30,000 to 40,000 actual cases.

Data published by Huddleson, *et al.* (1937) may be used to obtain a much higher figure for the prevalence of brucellosis. They carried out an investigation in a county hospital in Michigan where a part of the supply of milk was known to be infected with brucella. These investigators found evidence that 7.1 per cent of the 8,124 inmates were infected. If that percentage of the entire rural population of the United States were infected, the total figure would be approximately 4,000,000.

The actual number of persons suffering from brucellar infection in this country during any year probably lies somewhere between 40,000 and 4,000,000. Perhaps the smaller figure may represent approximately the number of persons who are disabled or partially disabled for a considerable time during the year. In other words, it may roughly represent the number of patients with brucellosis who consult a doctor. Perhaps the larger figure may not be too high if it is taken to include mild cases of transitory infection in which recovery is complete after a few days of indisposition, and cases of the chronic disease in which the general health is impaired by a localized infection of many years' standing.

#### RESEARCH PROBLEMS

A fundamental problem of brucellosis is the discovery of methods for the control of the disease in animals. Urgent from the point of view of both the human and animal disease is the discovery of an effective therapeutic agent. The development of laboratory techniques to facilitate the recognition of the mild form of the disease is important. Many other brucellar problems on which information is incomplete should be in-

vestigated. Some of them were suggested in the preceding pages.

#### REFERENCES

- Alessandrini, A. *Ann. d'Igiene*, 48:205-223 (Abst. in *Bull. Hyg.*, 13:646), 1938.  
 Angle, Fred E. *J.A.M.A.*, 105:939-941, 1935.  
 Angle, Fred E., and Algie, William H. *Ann. Int. Med.*, 12:1189-1191, 1939.  
 Atwood, George E., and Hasseltine, H. E. *Pub. Health Rep.*, 45:1343-1354, 1930.  
 Bang, B. *Ztschr. f. Tiermed.*, 1:241-278, 1897 (Jena).  
 Beattie, C. P., and Rice, Raymond M. *J.A.M.A.*, 102:1670-1674, 1934.  
 Benning, Henry M. *J.A.M.A.*, 130:320-325, 1946.  
 Bevan, L. E. W. *Tr. Roy. Soc. Trop. Med. & Hyg.*, 15:215-231, 1922. *Lancet*, 206:873, 1924.  
*Proc. Roy. Soc. Med.*, 19:8-13, 1925. *Brit. M. J.*, 1:415, 1933.  
 Boak, Ruth A., and Carpenter, Charles M. *J. Bact.*, 27:73, 1934.  
 Borts, I. H., Harris, D. M., Joynt, M. F., Jennings, J. R. and Jordan, Carl F. *J.A.M.A.*, 121:319-322, 1943.  
 Bruce, E. A. *J. Am. Vet. M. A.*, 76:841-842, 1930.  
 Calder, Royall M. *South. M. J.*, 32:451-460, 1939.  
 Cameron, W. Ross, and Wells, Marian. *South. M. J.*, 27:907-913, 1934.  
 Carpenter, Charles M., and Boak, Ruth A. *J. Bact.*, 33:40, 1937.  
 Carpenter, Charles M., and Merriam, H. E. *J.A.M.A.*, 87:1269-1271, 1926.  
 Caulkins, J. S. *Detroit Lancet*, n.s., 1:403-414, 1878.  
 Chuinard, E. G. *Northwest Med.*, 43:279-283, 1944.  
 Craig, Charles F. *Internat. Clin.*, 4:89-115, 1906.  
 Dargein and Plazy. *Bull. et Mém. Soc. méd. d. hop. de Paris*, 46:1373-1378, 1922.  
 Davis, Neal. *J. Indiana M. A.*, 35:459-461, 1942.  
 Deem, A. W. *J. Bact.*, 33:40-41, 1937.  
 Dustin, Cecil C., and Weyler, Henry L. C. *New England J. Med.*, 222:670-673, 1940.  
 Edwards, J. T. *Vet. Record*, 33:721-734; 739-748, 1921.  
 Evans, Alice C. *J. Infect. Dis.*, 22:580-593, 1918. *Pub. Health Rep.*, 39:501-518, 1924. *Hygienic Lab. Bul.*, 143:1, 1925. *J.A.M.A.*, 88:630-632, 1927. *Ibid.*, 103:665-667, 1934.  
 Evans, Alice C., Robinson, Frank H., and Baumgartner, Leona. *Pub. Health Rep.*, 53:1507-1525, 1938.  
 Feldman, William H., and Olson, Carl, Jr. *J. Infect. Dis.*, 54:45-50, 1934.  
 Ferenbaugh, Thomas L. *J.A.M.A.*, 57:730-731, 1911.  
 Fitch, C. P., and Bishop, Lucille M. *Cornell Vet.*, 28:304-306, 1938.  
 Fitch, C. P., and Dodge, Ruth E. *Ibid.*, 29:29-31, 1939.  
 Gage, E. E., and Gregory, D. A. *J.A.M.A.*, 87:848-849, 1926.  
 Gaylord, Willis, and Tucker, Luther. *The Cultivator*, 10:92, 109, 195. Albany, N. Y., 1843.  
 Gentry, Ernest R., and Ferenbaugh, Thomas L. *J.A.M.A.*, 57:889-890; 1045-1048; 1127, 1911.  
 Gilbert, Ruth, and Coleman, Marion B. *J. Infect. Dis.*, 54:305-312, 1934.  
 Giltner, Ward. *Memoir No. 1*. Michigan Agric. Exp. Sta., 1934, 118 pp.  
 Goldfain, E. *South. M. J.*, 31:325-327, 1938.  
 Good, Edwin S., and Smith, Wallace V. *J. Bact.*, 1:415-422, 1916.

- Goss, Clark C. *Northwest Med.*, 40:419-423, 1941.
- Griggs, Joseph Franklin. *California & West. Med.*, 58:118-125, 1943.
- Hardy, A. V., Jordan, C. F., Borts, I. H., and Hardy, Grace Campbell. *Pub. Health Rep.*, 45:2433-2474; 2525-2572, 1930.
- Harris, Harold J. *Brucellosis (undulant fever) Clinical and Sub-clinical*. New York: Hoeber, 1941, 286 pp.
- Hartsock, Charles L. *Cleveland Clin. Quart.*, 9: 22-31, 1942.
- Hasseltine, H. E. *J. Am. Vet. M. A.*, 76:330-338, 1930.
- Hayes, F. M. *J. Am. Vet. M. A.*, 84:322-329, 1934.
- Hayes, F. M., and Traum, J. *North Am. Vet.*, 1: 58-62, 1920.
- Holbrook, J. S. *South. Med. & Surg.*, 104:267, 291-294, 1942.
- Holland, C. F. *J. Michigan M. Soc.*, 39:666-670, 1940.
- Holt, Rufus L., and Reynolds, Francois H. K. *Mil. Surgeon*, 56:414-424, 1925.
- Horning, Benjamin G. *J.A.M.A.*, 105:1978-1979, 1935.
- Huddleson, I. Forest. *Brucellosis in Man and Animals*. New York: The Commonwealth Fund, 1943, 379 pp.
- Huddleson, I. Forest, Munger, Myrtle, Gould, S. E., and Paulson, Doris. *Am. J. Trop. Med.*, 17:863-880, 1937.
- Hughes, M. Louis. *Mediterranean, Malta or Undulant Fever*. London: Macmillan, 1897, 232 pp.
- Hutchings, L. M. *Proc. 48th Ann. Meeting. U. S. Livestock San. Assn.*, 1944, pp. 105-109.
- Hutchings, L. M. *J. Am. Vet. M. A.*, 106:135-144, 1945.
- Jordan, Carl F., and Borts, Irving H. *J.A.M.A.*, 130:72-75, 1946.
- Kabler, Paul, and MacLanahan, Margaret. *J. Infect. Dis.*, 58:293-298, 1936.
- Katz, Julius S. *J. Am. Vet. M. A.*, 99:24-27, 1941.
- Keefer, Chester S. *Bull., Johns Hopkins Hosp.*, 35:6-14, 1924.
- Knowlton, Millard. A Case of Malta Fever in New Haven. *Rep.*, Connecticut State Dept. of Health, 1925, pp. 101-108.
- Lehr, Eric. *Illinois M. J.*, 86:272-277, 1944.
- MacNeal, W. J., and Kerr, Josephine E. *J. Infect. Dis.*, 7:469-475, 1910.
- Manchester, Robert C. *Ann. Int. Med.*, 16:950-965, 1942.
- Mascal, Leonard. 1567. Quoted by Edwards.
- McGinty, A. Park, and Gambrell, W. Elizabeth. *New Internat. Clin.*, 1: Ser. 2, 1-27, 1939.
- McNutt, S. H. *J. Am. Vet. M. A.*, 84:620-627, 1934.
- Melvin, A. D. *28th Ann. Rep., B.A.I.*, 137-138, 1911.
- Menzani, R. Abst. in *Bull. Inst. Pasteur*, 31:235, 1933.
- Meyer, K. F., and Shaw, E. B. *J. Infect. Dis.*, 27:173-184, 1920.
- Mohler, John R., and Traum, Jacob. *28th Ann. Rep., B.A.I.*, 147-183, 1911.
- Mühlenbeck, *Med. Klin.*, 33:124-125, 1937.
- Newett, A. W., Koppa, T. M., and Gudakunst, D. W. *A.J.P.H.*, 29:739-743, 1939.
- Orpen, L. J. *J. South African M. Rec.*, 21:325, 1923. *Ibid.*, 22:75, 1924.
- Polding, John B. *J. Am. Vet. M. A.*, 96:30-35, 1940.
- Poston, Mary A. *Pub. Health Rep.*, 53:1-4, 1938.
- Rice, Thurman B. *J. Indiana M. A.*, 37:1-5, 1944.
- Roberts, W. R., and Roberts, E. L. *Illinois M. J.*, 75:247-252, 1939.
- Robinson, Frank H., and Evans, Alice C. *J.A.M.A.*, 113:201-206, 1939.
- Schmidt, Harry J. *New Orleans M. & S. J.*, 96: 43-50, 1943.
- Schroeder, E. C., and Cotton, W. E. *28th Ann. Rep., B.A.I.*, 139-146, 1911.
- Simpson, Walter M. *Ann. Int. Med.*, 15:408-430, 1941.
- Smith, Theobald. *J. Exper. Med.*, 49:671-679, 1929.
- Staub, Raymond R. *Northwest Med.*, 43:274-279, 1944.
- Stiles, Geo. W. *Rocky Mountain M. J.*, 42:18-25, 1945.
- Stone, W. S. *J. Am. Vet. M. A.*, 99:118-120, 1941. *Cornell-Vet.*, 33:115-119, 1943.
- Taylor, R. M., Lisbonne, M., and Vidal, L. F. *Mouvement sanitaire*, No. 130, 1935, 40 pp.
- Traum, J. *Ann. Rep., B.A.I.*, U. S. Dept. Agri., 1914, p. 30.
- Urschel, Dan L. *J. Indiana M. A.*, 36:59-63, 1943. *Ibid.*, 36:294-298, 1943.
- Watkins, W. Warner, and Lake, G. C. *J.A.M.A.*, 89:1581-1584, 1927.
- Wight, A. E. Personal conversation, 1945.

# Problems of an Aging Population\*

## Setting the Stage

LOUIS I. DUBLIN, PH.D., F.A.P.H.A.

*Second Vice-President and Statistician, Metropolitan Life Insurance Company, New York, N. Y.*

IT is high time that public health officers took notice of the health problems and opportunities centering around the middle and older ages of life. Today's discussion should be a profitable one; it may be historic, if we realize fully the implications in the changes which have been taking place in our population structure and in the widening sphere of influence of the public health profession.

For extraordinary changes have taken place and are continuing to take place in the population of our country. Ours is still a young country, and one of its most striking characteristics has been the low average age of the people. Even today half of our population is under 30 years of age. Until fairly recently our population grew rapidly in numbers. It is well to remember that the entire history of our country, including the period of colonization, is encompassed by only three centuries. Between the first federal census in 1790 and the last in 1940, the population increased to 33 times the original figure. Our people were particularly fertile and their heavy natural increase was augmented by a continuous flow of large numbers of young immigrants from virtually every section of the European continent. The combination of these two factors determined the

age structure of our population. Our country, in contrast to the more settled areas of Europe, had a strikingly large proportion of children and young adults. Every observer of the American scene has commented on this important characteristic.

In view of the large concentration of children and young adults in our population so far in its history, it is fortunate that the timely discoveries of the bacteriologists and the achievements of the sanitarians have been in the field of the infectious diseases—the conditions most prevalent in the early years of life. It is no wonder that the public health activities, in fact, the major part of the public health program, concentrated on the control of this group of diseases. The activities of the health officer and his staff as they developed have centered primarily on such conditions as the communicable diseases of children, the disorders of the puerperal state, on the sanitation of the environment, with especial reference to the control of typhoid fever, the diarrheal diseases, and tuberculosis. In this way, a pattern of health service has emerged which has been fairly well established throughout the land and, let me add, has been extraordinarily successful. Public health work is the crown jewel in the structure of our public services.

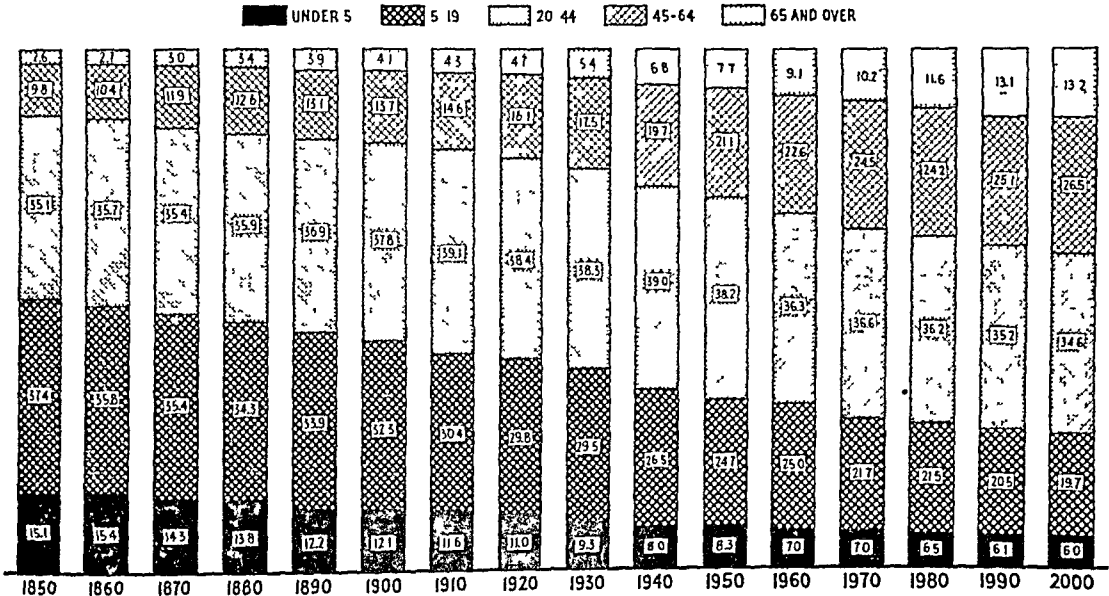
This health service, fortunately, has not been, nor is it now, static in character. The public health pro

---

\* Presented before the Health Officers Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 14, 1946.

CHART 1

PERCENT DISTRIBUTION OF TOTAL POPULATION BY AGE  
UNITED STATES, 1850 TO 2000\*



\* 1850 to 1940 from U.S. census data  
1950 to 2000 from estimates published by Bureau of the Census 1946

Metropolitan Life Insurance Company

fession has always been ready to adapt itself to new situations, to try out new procedures, and to widen its sphere of influence. Being a relatively young profession, it has the vigor and resourcefulness of youth. It is now confronted with a new and enticing opportunity for valuable service brought about by the very success of its previous endeavors and by the changes which have accumulated in the population structure of the country. That is what we are concerned with at this particular session.

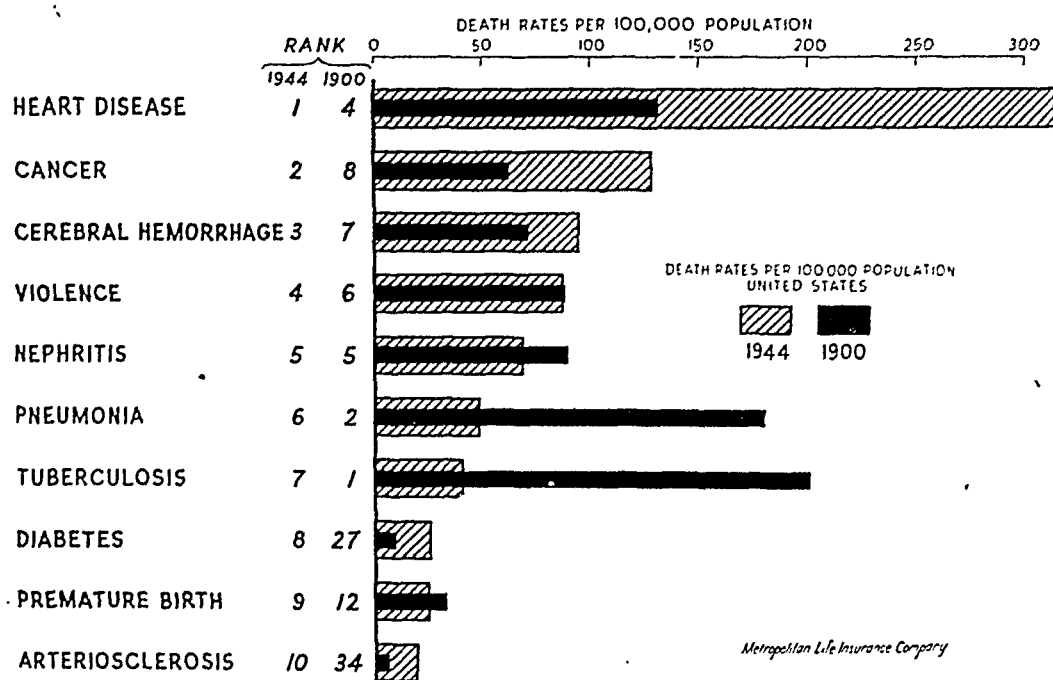
The fact is that our country is rapidly settling down to a new demographic pattern. From the beginning of the century, our birth rate has dropped about one-third. Immigration has been drastically cut in the period since 1924. As a result of these two forces, and the increasing numbers surviving into middle and later life, there has been a marked shift in the distribution of our population, from youth to the older ages. Chart 1 illustrates what has happened and what is likely to happen in the course of the next two generations.

Thus, in 1900, less than one-fifth of the population was 45 years or more in age; by 1940, the ratio had increased to more than one-quarter of the total. This trend will continue for many decades. Careful forecasts indicate that by 1960 almost one-third of our population will be 45 years of age or over, and that, by the end of the century, two-fifths of the people will be in that age category. If we concentrate on the group 65 years and older, the changes since 1900 and those in prospect are even more striking. Thus, at the turn of the century, this older group included 4.1 per cent of the population. By 1940, the figure had increased to 6.8 per cent and, by 1960, the best indications are that over 9 per cent will be in the old age bracket.

Obviously, the progressive health officer is taking note of these striking changes. He will see that the whole community picture is taking on another aspect. He will not rest upon his past achievements and let slip opportunities for services as important, even if not so dramatic, as those which confronted his

CHART 2

# RANK AND DEATH RATES FROM TEN LEADING CAUSES IN 1944 COMPARED WITH THE SAME CAUSES IN 1900



predecessors 30 and 40 years ago. The public health program must adjust itself to the problems and demands which arise from the new demographic set-up.

As an indication of the changes that have taken place even within our own time, let us compare the leading causes of death today with what they were at the beginning of the century (see Chart 2). At that time, the first and second ranks among our causes of death were held by two infectious conditions, namely, tuberculosis and pneumonia; these two causes alone then accounted for over one-fifth of the total mortality. Since that time, they have fallen to sixth and seventh place in rank and now constitute barely one-twelfth of all deaths. Of the first five causes in order of magnitude, in the present situation, four—heart disease, cancer, cerebral hemorrhage, and nephritis—are diseases characteristic of middle life and old age. Diabetes and arteriosclerosis, the eighth and tenth in order of rank, are likewise typical conditions at these stages of life.

Altogether, these six causes account for over three-fifths of all deaths registered in 1944, the last year for which country-wide figures are available. Even in the case of the two infectious diseases appearing in the list for 1944, pneumonia and tuberculosis, 54 per cent of the deaths occurred at and after age 45.

The age picture of mortality has thus greatly changed. In 1900, only 40 per cent of all deaths were at ages 45 and over; today, about 75 per cent fall into these ages. By 1960 more than four-fifths of all deaths will be at age 45 or higher, and the proportion will rise to more than nine-tenths by the end of the century. In so far as the public health officer is concerned with the mortality situation, he must concentrate his activities more and more on the diseases and conditions which affect the older ages.

Morbidity data likewise reflect the changes we have described in the age structure of our population. Every hospital director and every director of a

nursing service has felt the impact of these changes in recent years. The pattern of disease incidence, like mortality, has shifted to feature the conditions at the older ages. Thus, in the country-wide Metropolitan nursing experience for policy holders in 1925, nearly 50 per cent of the cases were nursed for the acute and communicable conditions, most of which occur in early life, and only about 5 per cent were for the chronic diseases—conditions typical of old age; in 1945, on the other hand, the two figures were 14 and 28 per cent, respectively. A complete reversal in emphasis has taken place. Recent sickness surveys, including especially the National Health Survey of 1935-1936, show how great the burden of invalidism has become at the older ages. If the age frequency of invalidism as observed in the National Health Survey prevails in our current population, then 70 per cent of our invalids, that is, persons permanently disabled, are at ages 45 or higher; by the end of the century, 80 per cent of the invalids will be in this age range.

The health officer of today, freed from many of the community threats of his predecessor, must take on the new challenges which confront him. More and more, he must adapt his services and his facilities to the needs of those who are now presenting him with a whole host of health problems. It is not for me, in these preliminary remarks, to discuss the specific functions which the health officer may well take on in serving the health of the middle aged and older people. That will be done very well by those who follow me in this program. All that I wish, in addition, is to point out how great are the opportunities for substantial accomplishment if the situation is approached seriously and the necessary adjustments in personnel and facilities are made.

Let us take, for example, the problem of cancer which Dr. Lombard will dis-

cuss. How many of us realize that this disease is responsible for shortening the average remaining lifetime of those entering middle life by about  $1\frac{1}{2}$  years. If we could make a dent in this condition from the preventive aspects, a very significant contribution would be made. The same is true with reference to the cardiovascular-renal conditions. The diabetes problem, which Dr. Wilkerson has as his subject, will grow rapidly in importance as our population ages. If, through the more extensive application of the health services of the country, be it through health education, the development of special diagnostic clinics, or the provision of medical and nursing care, we could reduce the volume of invalidism from these conditions at the middle and older ages, we would not only add appreciably to the life expectation but also increase the productive capacity of the country.

It is not suggested that the entire burden of the diseases of middle and old age shall suddenly be assumed by the public health services of the country. Obviously, the largest measure of care for this older group of the population must remain in the hands of the practitioners of medicine and an increasing measure be left to the ministrations of the voluntary health agencies. What we are attempting today is to clarify the rôle which the official health agencies may play as partners in this three cornered set-up of medical service, preventive health service, and friendly social service, working together in order to meet a great public need. I am confident that, as the years roll by, a larger share of the time and resources of our health departments will be concerned with the prevention and care of the disorders which afflict the middle and older years of life. It is not only the opportunity but the duty of the public health profession to prepare itself for this service.

# Problems of an Aging Population\*

Care of the Aged and Chronically Ill

THEODORE G. KLUMPP, M.D.

*President, Winthrop Chemical Company, New York, N. Y.*

A CENTURY and a half ago, Horace Walpole wrote these lines: "About the time, or a little later, I die, the secret will be found of how to live forever." Feeling that enough time had passed to vouchsafe a reply, Helen Bevington answered:

Horace, be comforted to die.  
One century has meandered by  
And half the next since, it was true,  
The temporal state eluded you.  
Now as I read your pensive letter,  
I wish myself that times were better  
And I might boast how men contrive,  
As you foretold, to stay alive.  
By now we should possess the key  
To fleshly immortality  
And, if we wanted to, endeavor  
To live forever and forever.  
This, to my infinite regret,  
Is not a custom with us yet.

I write you Horace for good cheer  
Life is about as usual here.

Unfortunately, life is about as usual here so far as our knowledge of the nature of the aging process and many chronic diseases is concerned. In the past we have been largely preoccupied with the diseases of youth and childhood. Our chief endeavor was to learn to run the gauntlet of infections so that we might raise a reasonable number of our children to adult life. We have not yet finished this job and we never will altogether—but mortality statistics show that we have made great advances for which our physicians, research workers,

and public health officials can feel justly proud.

But, as a result of our success in conquering infections and some of the most deadly diseases of childhood, we now have an adult population that is larger in proportion than it has ever been before. It promises to grow even greater as the years roll by. This poses new public health problems, and hitherto neglected diseases assume compelling importance. The care of the aged and chronically ill must not be left to the old man with the long white beard and the scythe.

In a sense we are now standing where the stream divides. For generations we have followed the branch of infectious diseases. It has dwindled in size, but we have not yet really started the exploration of that other stream that flows in the direction of the chronic diseases of adult life and geriatrics. A whole new field of knowledge is waiting to be studied and mastered. We have not even begun to think seriously about the sociological and public health aspects of old age and the chronic diseases. Neither medicine, nor industry, nor the State, has any carefully thought out program of what to do about the vast population of older persons that is rising in our midst. Only Dr. Townsend has a \$50 every Friday plan which most other doctors feel is not the answer.

Our research has not scratched the surface of such problems as heart disease and coronary thrombosis, nephritis, arthritis, and cancer. We know more

\* Presented before the Health Officers Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 14, 1946.

about the planet Mars than we know about the pathogenesis of arteriosclerosis which is probably the least common denominator of most of the disabilities of the aging process.

Some indication of the increasing importance of the problems to which I have alluded may be gained from figures on the percentage of our population in the older age groups. According to U. S. Census figures, and reliable estimates with respect to the future, the following represents the proportion of our population 45 years of age and over:

	<i>Per cent</i>
1860.....	13.1
1880.....	16.0
1900.....	17.8
1920.....	20.8
1940.....	26.5
1960.....	33.3
1980.....	40.3

When we consider those 65 years and over, the following percentage distribution is reflected:

	<i>Per cent</i>
1860.....	2.7
1880.....	3.4
1900.....	4.1
1920.....	4.7
1940.....	6.8
1960.....	10.0
1980.....	14.4

The important facts to be derived from these data are that the weight of our population is shifting toward the older group, and by 1980 two-fifths of our population will be over 45, and one-seventh over 65. At the same time the total number of our people is also increasing. It has been conservatively estimated that we will have not less than 150 million people by 1980. This means that by that time there will be not less than 60 million 45 years and over and over 21 million 65 and over. Think of it, 21 million persons 65 and over! These figures have special significance in the light of the all-time employment record which has just been announced by the President as 58 million gainfully

employed. This means that in less than 34 years we shall have more individuals over 45 years of age than the total number employed at the present time. We must also anticipate the continued introduction of new labor saving devices, perhaps on a scale never dreamed of before. The technologies recently developed, particularly in electronics, and the upswing of interest in science generally should provide for that. If we do nothing about it, and maintain present-day working standards and conditions, we shall have a potential labor surplus of over 30 million workers by 1980.

And now let us for a moment turn to the chronically ill. According to the U. S. Public Health Service the number of persons in the United States suffering from certain chronic diseases in 1937 was as follows:

Arthritis and rheumatism.....	9,700,000
Heart disease .....	3,700,000
Hay fever and asthma.....	3,450,000
Chronic bronchitis .....	1,700,000
Nephritis and kidney disease.....	1,550,000
Nervous and mental diseases.....	1,450,000

These are only a few of the chronic diseases. The list would be too long to mention them all. We have not taken into account such seriously disabling diseases as diabetes, thyroid diseases, blindness, tuberculosis and other chronic infections. It has been estimated that in 1943 there were 25,000,000 suffering from chronic ailments, with an annual disability rate of 1 billion man days, and approximately 1 million deaths a year from the same cause. Add to this 9,700,000 individuals partially or totally disabled from accidents and it may be seen that we have a problem on our hands that is greater than most people realize. As the number of older individuals in our population increases, this problem too will become accentuated.

What are we to do about the aged and the partially disabled? We cannot plow them under as we used to plow under corn, potatoes, tobacco, and little



pigs. And I am equally certain that we cannot just turn them out to pasture and expect them to enjoy life. People are not happy when they are idle, and this is particularly true of older individuals. Youth can loaf content with opiate dreams of future achievements. But as we grow older the realities of life are more clearly seen and less easily denied and as we approach 50 and 60 we can no longer derive solace from the pipe dreams of future achievements. Similarly the diversion of participation in sport and exercise is denied us. Age plays for real stakes, not pastime. It wants something to do and it must be real. And the most real thing we have to sustain us in this life of ours is useful work for which we are paid in money or in kind. Have you seen, as I have, a faithful employee who has been working at his job for 20, 30, or 40 years and wants to continue? Have you seen such an employee "retired" to the boneyard by some blind compulsory retirement scheme? There is an unutterable sadness about it that sometimes makes me think that it would be kinder to shoot the old fellow. I believe I understand why so often they die shortly after retirement.

Any biological organism that has been accustomed to a set routine for 40 or 50 years cannot suddenly be shaken from its orbit without untoward consequences. Anyone who has studied Cannon's ideas on homeostasis will recognize this.

Our society has been quite illogical and inconsistent in its attitude toward the older worker. On the one hand it is apparent that we have no objection to electing and appointing older individuals to positions of the greatest responsibility in government, business, and the professions. For instance, in the present Congress 32 Senators, or 41.3 per cent, are over 65 years of age, 12 or 15.3 per cent, are 61 to 65 years of age; in other words, over 56 per cent are over

60. In the House of Representatives, 57, or 21.3 per cent, are over 65 years of age, and 36 representatives, or 13.4 per cent, are 61 to 65 years of age. A study was made of top business executives as listed in *Poor's Directory*. Taking 500 consecutive names contained therein it was found that 143, or 28.6 per cent, of those listed were over 65 years of age, 78, or 15.6 per cent, were between 61 and 65 years inclusively. Here again, over 44 per cent are over 60 years of age. I am certain that a study of the leadership of the various professions would reveal the same large proportion of individuals in the older group.

And yet as far as the rank and file of workers is concerned we have no objection to the imposition of blind and unselective compulsory retirement rules which automatically eliminate those in the ranks who have reached the same age regardless of their fitness, ability, and contribution to the group for which they labor. More precious than oil or fertile soil, than ore and minerals, than trees or an equable climate, are the human resources of a country. All other things were here when Columbus discovered America, but it took intelligent, industrious men to make our country what it is today. We may not fully realize it, but we cannot afford to waste the contributions of those who through years of experience have learned to do their jobs well and are willing and able to continue faithfully. Training and experience can only be replaced by training and experience, and when we retire a competent older worker his successor has the burden, inevitably, of supporting the man he replaces as well as himself.

Some individuals welcome retirement, and the possibility of voluntary retirement on a pension should always remain open for these. But if the premise is that all individuals over 65 or 70 are not worth their keep, then least of all should we permit individuals above

those ages to occupy the top and critical positions in our social structure. If we acknowledge, as is certainly true, that some are and some are not fit at those ages, then we should use our intelligence to devise methods of determining which are and which are not fit for all workers, not just the upper crust. As the great physiologist, A. J. Carlson, stated: "The physiologic age of the worker is not synonymous with his chronologic age, owing to the individual variables in heredity, mode of living, accidents and sequelae of disease." Likewise, "All age changes come on gradually," according to Carlson, and we know now that in some individuals changes characteristic of senescence begin even in childhood. And biologically we all start to grow old the moment we stop growing.

That such changes may proceed very gradually and slowly is illustrated by the fascinating and possibly authentic story of Christen Jacobsen Dragenberg reported in the *Journal of the Institute of Actuaries*. His manner of life may be instructive for those who seek longevity. Dragenberg was a Dane who lived to be 146 years of age from 1626 to 1772. He went to sea when he was 13, took part in the wars of three kings against Sweden, served many nations in merchant navies, when nearly 70 was taken prisoner by Algerian pirates, was sold as a slave, escaped slavery after 15 years, and at 84 again went to war against Sweden. At 111 he married a woman of 60, outlived her, proposed at 130 to several women but was rejected. Mastering his disappointment, he lived on for 16 years. Described as being of impetuous temperament, he lived a life far from blameless, but in his last 5 years, from 141 to 146, exhibited a conduct "quite respectable."

We choose and select when we hire, and I see no reason why we cannot do the same thing when we retire our workers. In 1930 on the basis of a compulsory retirement rule, the most dis-

tinguished neurological surgeon the world has yet known, Harvey Cushing, was retired from the Harvard faculty at a time when he was at the peak of his ability. He promptly accepted a full-time academic appointment at Yale where he continued his outstanding contributions to medical science. What was Harvard's loss was Yale's gain, but for Dr. Cushing the retirement rule meant only the waste of time and inconvenience of pulling up stakes, moving, and finding a new home.

When Dr. Milton J. Rosenau was retired from the same faculty he too moved to another university where the rules were not so blind. From a sociological standpoint the whole thing is ridiculous, and a reflection on the state of our intelligence in solving what ought to be a simple problem. Whenever society adopts a rule that eliminates the fit with the unfit, destroys the good with the bad, or punishes the innocent with the wicked, it is not a good rule. Society progresses by changing rules of this kind. In an imperfect society human beings are pushed around as a faceless mob. But social progress may be measured in the last analysis by the degree of skill and discrimination with which society solves the individual problems of its members.

The argument has been advanced that we must clear out the older workers to make room for the younger men so that their progress upward in an organization will not be unduly retarded. On the face of it this line of reasoning appears to have some merit. But it is only another way of stating that there are more workers than there are jobs. During the war when there was a man power shortage no one was afraid that the old, the lame, the blind, and the halt, were taking jobs away from younger and more able workers. At other times similar arguments have been applied against the employment of women in business, government, and the profes-

sions. Certainly there is no arbitrary age at which older workers begin to repress the advancement of younger individuals. In a sense, every older individual higher on the ladder of advancement, whether he be 65 or 55 or 45 is holding a job that a younger individual aspires to and feels he can fill. That is always true and it will be just as true if we force everyone to retire at 50 or even 45 as we will have to do by 1980 if we do not find a more logical way of reducing the disparity between jobs and workers.

We must not lose sight of the fact that someone must support those that we retire to idleness. The more workers we eliminate, and particularly if we should lower the retirement ages, the greater will be the economic burden we will place on those who do work. They will have to produce enough to support themselves and their families as well as the increased numbers of those who become emeritus workers. The whole problem is the adjustment of the number of workers to the number of jobs available. To attempt to strike a balance by eliminating all workers over a certain age is an unfair penalty on age and experience. In a refined and delicate way it is a perpetuation of the jungle law of the fang and claw where the leaders of the pack survive only until the younger beasts grow fierce enough to eliminate them. In modern civilization we are less violent but the end result is approximately the same.

One of the most important steps in solving this problem is the successive reduction in working hours for all workers rather than by reducing more and more older workers to a state of parasitism. I venture to say that you and I will live to see a thirty hour week in industry.

Another view that is widely held is that older individuals become over-conservative, and to make progress we must eliminate these obstacles in the path of progress. Here again there are

such wide variations in human reaction patterns that I do not see how one can logically draw generalizations that will fit individual cases. Certainly Bernard Baruch, 76 years of age, is no obstacle in the path of progress, and neither Senator Pepper nor Henry Wallace has become more conservative as he has grown older. As far as the great mass of jobs now subject to compulsory retirement is concerned, it makes no difference at all whether an individual grows more or less conservative. If individuals in key positions become too conservative with age or even too reckless, as they sometimes do, to meet the best interests of the organization, a retirement board operating on a selective basis can function to correct this development, as well as any others that may arise.

The war has given us a slight stimulus toward finding jobs for partially disabled workers. We have not yet developed this as far as the German ulcer battalions are concerned, and a great deal of educational work remains to be done with industry and government. When a worker is physically handicapped in one respect he tends to compensate for this handicap by development in other directions. This biological mechanism of compensation serves to make such workers perhaps even more valuable than normal workers in the tasks which they are fitted to perform. We have a vast educational job to perform here and it seems to me that those who are interested in industrial health and welfare should lead in this endeavor.

During the past decade industry and our federal and state governments have made great advances in provisions for the care of the aged. What we have accomplished is only a start and much more remains to be done. I am hopeful that the major burden of this can be carried by the extension of voluntary retirement plans in which the employer and the employee share the cost. Not

only must more realistic retirement benefits be provided, but such plans must be more widely adopted by employers generally. The problem of transferring retirement benefits without loss when an employee moves from one job to another remains to be solved. Under present-day practices a worker who changes from one job to another to advance himself, or for any other reason, is penalized by loss of the portion of his retirement accumulation which the employer contributes. For those not covered by adequate voluntary retirement programs, the present token social security benefits must be increased, and old age assistance on a lower scale provided for those who, for one reason or another, have failed to earn their share of the retirement burden.

Through workmen's compensation and health, accident and disability insurance we have also taken important steps in caring for those who are chronically ill and partially or totally disabled. Here again we have only made a start. There is room for improvement not only in the provisions made for the economic care of these unfortunates, but also in the medical and institutional care made available. We can understand why general hospitals wish to avoid having their beds filled with "chronics," but we will need an ever increasing number of institutions devoted solely to these cases.

While social advances in the direction I have indicated will cost money, there is no contribution we can make to human welfare and happiness that is of greater fundamental importance. Compared with the tax burden of war and armaments, which human ingenuity should be capable of eliminating, it is negligible. Even this tax burden can be lessened by permitting capable and willing older workers to continue working, and finding more places in industry and government for those partially disabled.

As we progress to a more perfect civilization, the goal of which is nothing more than a greater measure of happiness for all mankind, there is much that remains to be done for those that are aged and chronically ill. The following general principles will, in my opinion, serve as a guide toward this end:

1. Since physiological age is not synonymous with chronological age, compulsory retirement on a calendar age basis should be abandoned.

2. Since hiring is selective and based on fitness to do a given job, retirement should likewise be selective and based on unfitness. If we can do one there is no reason why we cannot do the other.

3. Compulsory retirement should be based on the recommendation of a retirement board composed of medical and psychiatric members as well as administrative officials.

4. In accord with Carlson's idea, if wage in proportion to performance is recognized as a fundamental principle, the older worker should taper off in industry, just as the young apprentice gradually works himself up in skill, performance, and remuneration. In other words, opportunities for down grading in position and salary should be offered. If this becomes a general practice, the aura of foolish pride which now stands in the way of this would soon disappear. The older worker can choose retirement if he does not like the idea.

5. Industry, governmental and private institutions must make a greater and more intelligent effort to employ partially disabled persons.

6. When the aged and disabled have work to do they are less of a burden, financially, socially, and spiritually to the folks at home. Other things being equal, home environment is better than an institution for the aged and disabled, and the strong and fit must learn to exercise a greater measure of patience, tolerance, and kindness toward them.

7. Institutions for the aged and disabled must be changed from asylums to modern institutions where every convenience and scientific development is available for their physical, mental, and spiritual comfort. The importance of occupational therapy must not be forgotten. Useless work such as basket weaving is not the answer. Under ideal conditions each institutionalized person will have a job tailored to fit his ability and aptitude and for which he will be paid in proportion to his production.

This paper has only one purpose: To emphasize the growing importance of

the problem of the aged and chronically ill. It is a plea for the the devotion of more thought, more research, and more funds to improve the lot of the largest and most neglected group of unfortunates in our society. It is from those interested in public health and welfare that we may expect leadership in this endeavor.

Old age is not a disease but the disabilities arising from it are. As we overcome these we not only postpone old age but we defeat the suffering and sorrow of old age.

Death has its final victory but it can come in peace, even as it came to my teacher and our late President, Dr. Milton J. Rosenau.

Best Sellers in the Book Service for January

An Appraisal Method for Measuring the Quality of Housing: A Yardstick for Health Officers, Housing Officials and Planners. Part I. Nature and Uses of the Method. American Public Health Association. 1945.....		\$1.00
The Control of Communicable Diseases. American Public Health Association. 6th ed. 1945 . . . . .		.35
Common Sense Book of Baby and Child Care. Benjamin Spock. 1946.....		3.00
Diagnostic Procedures and Reagents. American Public Health Association. 2nd ed. 1945 . . . . .		4.00
Health Insurance in the United States. Sinai, Anderson, and Dollar. 1946.....		1.50
Local Health Units for the Nation. Emerson and Luginbuhl. 1945.....		1.25
A Manual of Tropical Medicine. Mackie, Hunter, and Worth. 1945.....		6.00
Public Health—A Career with a Future. American Public Health Association. 1946..		.10
Recommended Practice for Design, Equipment and Operation of Swimming Pools and Other Public Bathing Places. American Public Health Association. 1942.....		.50
Standard Methods for the Examination of Dairy Products. American Public Health Association. 8th ed. 1941.....	paper	1.75
Standard Methods for the Examination of Water and Sewage. American Public Health Association. 9th ed. 1946.....		4.00

Order from the Book Service  
AMERICAN PUBLIC HEALTH ASSOCIATION

# Problems of an Aging Population\*

## Sheltered Care of the Aged

JOSEPH H. KINNAMAN, M.D., M.P.H., F.A.P.H.A.

*Deputy Commissioner, Nassau County Department of Health, Mineola, N. Y.*

NOW that Dublin has set the stage the relative importance of the medical-social problems of older persons are clearly seen against a proper backdrop. There are abundant signs that others are discarding those concepts of administrative practice which were based on 19th century census figures and a pastoral existence. Only a few examples need to be cited.

Federal social security legislation is one of the many signs that Congress is showing increasing concern for the basic needs of all the people. The appointment of state commissions to plan the development of hospital and other facilities for the care of the sick, aged, and handicapped persons is another indication. The mushroom growth of privately operated convalescent and nursing homes and of supervised boarding homes reflects the appreciation on the part of many people that the demands for medical, nursing, and custodial services outside the patient's own home are increasing.

The older person's own home or that of a relative still represents the most available and best facility for providing sheltered care for the aged and infirm. Yet many factors or combinations thereof frequently operate to make it physically impossible, medically unsafe, and socially unsound or uneconomical for older persons to have their needs met in such homes. A home will not

always be available to an older person. A family unit, even though willing to provide care for a relative or friend, may be unable to do so for a host of obvious reasons, not the least important being that housing itself is a major national problem. Community resources, such as bedside nursing, housekeeper aide, and rehabilitation training services, frequently have not been adequately developed to supplement the private home care of the ill or convalescent older person.

Every older person might be placed in a private home. (One authority estimates that 85 per cent of the chronically ill are now being cared for in their own homes.) As much and as good care at reasonable costs to the individual and the public might be provided. Yet, under certain circumstances, removal from the home and placement, at least temporarily, in another type of facility would be medically indicated or socially desirable. For example, hospitalization for major surgery is medically indicated. Placement in a convalescent or nursing home may be required in order to secure specialized nursing services; to complete the patient's restoration to health or to attain maximum arrest of a disease. For those older persons who are incapable of recovery, custodial care in a medical domiciliary institution may be socially desirable.

Care of the chronically ill and aged infirm outside of a private home or a hospital is usually given in facilities that have been termed by Rogers<sup>1</sup> as "nurs-

\* Presented before the Health Officers Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 14, 1946.

ing infirmaries," by Wagner<sup>2</sup> as "between hospital and home facilities," and by Griffin<sup>3</sup> as "commercial homes." Commonly these facilities are privately operated, but interest in this country for partial or complete support of "nursing infirmaries" with public funds is increasing. Public support of such facilities has developed earlier and to a greater extent in Great Britain than here.<sup>4</sup>

Convalescent or nursing homes, county or city public homes and their infirmaries, voluntary homes for the aged, small proprietary hospitals and supervised boarding homes are all types of sheltered care facilities.

A nursing home may be defined as a medical care facility in which sick, infirm, or handicapped persons not requiring hospitalization are provided with shelter, board, and essential nursing care under medical supervision.

Privately conducted homes for the care of the chronically ill, aged or infirm are rarely if ever adequate to meet the needs. All too frequently these homes provide a poor quality of care. Needs of the older persons in them are seldom the basis for service. The cost to the individual (and to the taxpayer, since public recipients are commonly placed in these homes) bears little if any relationship to the quantity and quality of care given. Buildings designed and constructed for use as nursing homes are seldom seen in the New York City area unless they are either publicly or philanthropically financed. Buildings built specifically for use as homes for the aged have been built with funds raised by fraternal, religious, or nationalistic organizations. Nursing homes almost invariably are conducted in large buildings, usually constructed of wood or other combustible material, that were intended for some other use, especially as single family dwellings. Such structures can never be made fire-safe.

Training or experience in nursing is rarely required of operators, even though nurses of one kind or another usually conduct most of the nursing homes. The bed capacity of such homes is usually limited and the nurse operator commonly assumes the combined duties of business manager, cook, housekeeper, and nurse. Presumably, schools offering approved courses in nursing home administration do not exist. If they do, operators in this area apparently have not taken sabbatical leaves. At least, the majority of operators of convalescent homes show little understanding or appreciation of the principle that convalescent care, to be truly effective, must be of such quality as to offer the maximum opportunity to the patient for rehabilitation and return to a period of economic usefulness and happiness. In Nassau County, New York, none of the eighteen privately operated nursing homes has medical services affiliated with the staff of a secondary hospital center as recommended by Rogers.<sup>1</sup>

Potter<sup>5, 6</sup> and Jarrett<sup>7</sup> have discussed more fully the shortcomings of presently available facilities of this type, and these authorities have also suggested remedies.

By 1946 at least 21 states were licensing either nursing homes alone or the gamut of medical care facilities. This is in addition to legislation dealing with facilities for mental diseases and tuberculosis, which legislation was enacted by many states years ago. Eight states require licensure of all facilities caring for sick and handicapped persons. In all states having this comprehensive coverage the health department is the licensing agency.<sup>8</sup> At least 13 other states have laws requiring the licensure of one or more types of facilities caring for the sick or handicapped.

The licensing agency in 7 of these is the state department of welfare; in 5, the state department of health; and in

1, New Jersey, a special state department. Facilities under certain auspices, such as federal, state, county, or local government, commonly (unfortunately) are specifically excluded from licensure. A license fee is required by most states. The license period is usually one year, not necessarily the calendar year.

The purpose of supervision is to improve the quantity and quality of the *total* services rendered to the consumer. Much of the present-day emphasis in supervision is on safety from fire, sanitation of the environment, and adequate provision for the basic needs in maintaining life. All of them deserve attention. However, the important thing to remember is that the consumer, in such a facility, pays for and is entitled to receive quality attendant and nursing care under medical supervision. Consequently, unless supervision is concerned with the quality of medical, preventive, and health services, these facilities will not make an effective and necessary contribution to the total medical care program of a community. If the development of a "what's the use" attitude on the part of many older persons in these homes is to be prevented, supervision must be extended to include provision for a full social life according to the individual's physical and mental strength and capacity. Efforts to "add life to years, not merely years to life" have been amply rewarded according to Wagner<sup>9</sup> and Gorrie.<sup>10</sup>

The application of this philosophy of supervision requires that all the habits and thoughts of many people regarding "between the hospital and home facilities" be changed. Education is, therefore, a fundamental part of supervision. Medical practitioners, operators, and staffs of such facilities, members of the inspectional force responsible for supervision, appropriating and other officials, and the consumer public—all must be moved to assume their respective and collective responsibilities for super-

vision. The fact that a purposeful and well directed educational approach results in sustained improvements in services and in their extension has been amply demonstrated in connection with many other areas of medical-social service. Education is fundamental to integration of services and to the economic use of facilities.

Licensure of facilities for caring for infirm aged or chronically ill older persons is only one of the several responsibilities which government has for meeting the needs of that group. Far more important than licensure of institutions, and providing for it whenever indicated is an integrated approach to all of the medical-social problems involved in providing sheltered care for the aged. Such an approach holds the only real promise that a happy and satisfactory solution will be found for them.

Facilities are the great need today. They must be thoroughly practical and fully correlated with existing resources. In the final analysis, the achievement of the goal of having available to all who need them safe, sanitary facilities capable of providing medical, preventive, health and social services based on the needs of the whole person and dedicated to the purpose of returning, whenever possible, that older person to his own home and to a life of economic usefulness, will depend upon our social enlightenment and our willingness to provide for others those things which we most want for ourselves.

The reasonableness of developing plans for these facilities on a state-wide basis is generally supported. Integration of the findings of several study commissions keynotes the New York State approach. There a subcommittee of the (Ostertag) Joint Legislative Committee on Interstate Coöperation is undertaking a study of adult institutional care. The New York State Health Preparedness Commission is completing a study on the care of the chronically ill



and its report probably will include a section on nursing (and related) homes. The Joint Hospital Board of New York State is conducting a survey and developing a state-wide plan for hospital and health center facilities. Other studies of related problems also are in progress in this state.

The State of New York does not require licensure of nursing homes. The State Department of Social Welfare requires, however, that local departments of welfare "certify" to it, those nursing homes used for care of recipients of public assistance. The cities of New York, Yonkers, Mount Vernon, New Rochelle, and Syracuse, and the County of Nassau have ordinances specifically governing the establishment and operation of such homes.

Nassau County lies just east of New York City and is on Long Island. Since 1938, a full-time county department of health has served its semi-urban population, which now totals more than 460,000. Soon after the establishment of that department, Health Commissioner Earle G. Brown proposed that nursing homes be licensed, but this action was not taken then because the Administrative Code of the county did not provide for it. Later, as a result of a newspaper exposé of conditions in nursing homes located in the county, that Code and the Nassau County Public Health Ordinance were amended to provide for licensure of such homes, effective October 1, 1941. The provisions of that ordinance are essentially the same as the regulations governing nursing homes of the Department of Hospitals, New York City. In Nassau, the county department of health is the licensing agency.

When licensure was inaugurated, although inspection disclosed the need for general improvement, only a few were unsatisfactory. Only 1 of these 20 private institutions was being conducted in a fire-safe building, which was designed

and constructed specifically for use as a home for older persons; the other 19 generally lacked adequate safeguards against fire.

The total bed capacity of all within-the-county facilities, excluding boarding homes, but including public institutions, is less than 800, or approximately 53 per cent of the required capacity proposed by Stone.<sup>11</sup> The combined capacity of the 18 private nursing homes is slightly in excess of 500. The County Home and Infirmary provides sheltered care for approximately 138 persons. A county home for ambulatory, non-handicapped persons, Jones Institute, has a maximum capacity of 100. General hospitals, particularly Meadowbrook, a county-maintained institution, provide care for a small number of chronics.

In 1945 recipients of public assistance occupied beds in 60 per cent of the private nursing homes operating in Nassau County. The county department of public welfare used two, including the largest, of three such facilities having a bed capacity of 50 or more. One out of every four of the total beds available in private nursing homes was occupied by a recipient of public assistance. At least 30 assistance cases were being cared for in facilities located outside the county. The county department of public welfare also placed recipients in "foster homes" and in boarding homes.

Administrative problems encountered in connection with the regulation and supervision of nursing homes have resulted from (1) the number of governmental officials involved in licensure; (2) the habits of thought and action of public officials, some of whom are not directly concerned with licensure; (3) the language of the regulation, which frequently makes possible more than one interpretation of the intent; (4) the inability of operators to secure adequate and qualified personnel, especially

nurses, and needed materials for structural improvement; (5) the acute shortage of beds in general hospitals and allied medical facilities; (6) the number of older persons suffering from mental changes of non-committable character; (7) the fact that the present provisions of the federal Social Security Act preclude payment of benefits to individuals in public institutions; (8) the fact that the New York State law does not make care in a public institution a reimbursable item and, conversely, that in this state, care in a private nursing home is a reimbursable, medical item.

Some things have been done in Nassau County that seem to warrant application elsewhere. To secure for all nursing homes the required certificate of conformance or approval covering zoning, building, and fire, from officials having jurisdiction, the Nassau County Department of Health has to deal with a minimum of 15 authorities. Those officials had to be brought together for the purpose of securing the greatest possible uniformity of attitude and action. This has been done through conferences and by the inauguration of "team" inspections. Through conferences with zoning, building, and fire officials, the department has been able to secure a statement of minimum requirements for fire and building safety which every local inspector will enforce. The department has been able to give written notice to all nursing home operators a full year in advance of the effective date of any new requirements of fire and building authorities.

Inspection by a "team" has merit because all persons responsible in any way for licensure have an opportunity to see the home under the same conditions; all findings can be integrated and recommendations agreed upon; the operator is informed at the time of the inspection of all violations, and recommendations are summarized. Subsequently the health department makes a

written summary of all findings and recommendations. A copy of this report is placed in the hands of the operator and all officials concerned. When inspections of nursing homes are made independently by fire, building, health, and welfare officials, the fact that these homes are medical care facilities is not sufficiently impressed on the minds either of the officials or of the operators. Not uncommonly zoning regulations prohibit operation of commercial homes in a village because they are considered undesirable. When prohibition results for that reason it would appear that the need for and the contribution that nursing homes make to the total medical care program of the community have not been effectively emphasized by the licensing agency.

Administration has been made more effective through other uses of education. An institute on nutrition was offered to nursing home operators. Attendance was excellent. Public health nurses and medical personnel on the staff of the department periodically review medical and other records which are required of nursing home operators.

A consultative and advisory service has been initiated by the department. Such services are available to existing operators, to those who plan to open nursing homes, to public officials, and to the general public. One of the practical values of such services to prospective operators is protection against rental or purchase of a building which either cannot be used because zoning ordinances prohibit or cannot be economically converted for use as a nursing home. Those operators who plan to remodel or to extend their facilities are assisted with the practical planning for such changes. It would be helpful to officials and operators alike were the U. S. Public Health Service to prepare suggested plans and specifications for nursing homes as it has already done for hospital and health center facilities.

The department has assisted operators in securing priorities for equipment and materials and by putting them in touch with nurse registries. Frequently information is made available to members of the medical profession and the general public regarding availability of beds in nursing homes. This information service has also been utilized by public officials, notably welfare officials.

The Nassau County Department of Health requires the reporting of all accidents which happen in nursing homes, irrespective of evident injury therefrom. The department then investigates the conditions under which these accidents occurred. Such vital data are generally not available in "Accident Facts." They are obviously a necessary basis for the formulation of a program for prevention of accidents in such medical care facilities.

During 1945 the County Department of Health, public welfare and fire prevention agencies jointly considered existing nursing home facilities in relation to need, and filed recommendations with the Office of the County Executive. One of the recommendations was that consideration be given (1) to the full utilization of existing community resources, including public facilities, for the care of the sick, infirm, and handicapped older persons; (2) to the development and maintenance of additional public facilities, for example, a county nursing home; and (3) to the admission of paying patrons to such public institutions. The County Executive has recently announced that Meadowbrook, a county operated general hospital, will be enlarged from 250 to 600 beds, and that a chronic disease unit is to be included in the plans for expansion of that facility. Primarily because the state law does not now permit reimbursement by the state to local governments for expenditures made by the latter for the care of recipients of public assistance in tax supported insti-

tutions, no county nursing home or other medical domiciliary care facility is eventuating. This suggests the need for amending the New York State law, so as to encourage communities to provide adequate medical care facilities.

The urgent need for beds, which cannot be met by the combined capacities of private and public nursing home facilities of this county, has resulted in a tendency to aggregate older persons in so-called boarding homes. When a home is, in fact, a boarding home and not a second-rate, unlicensed nursing home, it is a necessary and important community resource. New York State law does not require that departments of public welfare "certify" supervised boarding homes to the State Department of Social Welfare in order to be eligible for reimbursement for care of public recipients in them. Until and unless adequate nursing home facilities are available to all of the people it would seem unwise to encourage the development of supervised boarding homes. This viewpoint takes into account the fact that the passing of time has a significant effect on the needs of all people, especially older persons. Unless it is possible to remove persons from supervised boarding homes to nursing homes (and to hospitals and medical domiciliary care facilities) whenever they need the latter type of care and, conversely, to remove persons from nursing homes to boarding homes whenever the need is for only shelter and board under supervision, neither type of facility can be used effectively and economically.

Public health workers generally need to review critically their administrative practices in the light of the extent and special character of the needs of older persons.

Improvement and extension of nursing home and related medical care facilities are urgent needs in a nationwide, integrated approach to the

medical-social problems of all older persons.

Licensure of all private and publicly operated "between the hospital and home" facilities by the state department of health is administratively practicable and desirable.

Education should keynote the administration of a licensure law. Supervision should be inclusive and cover medical, preventive, health, and social services.

Corrective legislation is indicated. Care in a public medical facility should be a reimbursable item of expense to local government.

Care in a public institution should be available to all who need it. Payment for such services should be required according to ability to pay. Both privately and publicly operated medical care facilities should provide quality services geared to the needs of older persons.

In the opinion of the writer, the

American Public Health Association should add to its existing committee structure one on sheltered care for older persons.

#### REFERENCES

1. Rogers, Edward S. Chronic Diseases—A Problem That Must Be Faced. *A.J.P.H.*, 36:343-350 (Apr.), 1946.
2. Wagner, Hildegard. New York State Health Preparedness Commission. Personal communication to author, October, 1946.
3. Griffin, John J. Sheltered Care for the Aged. *Survey Midmonthly*, 81:323 (Dec.), 1945.
4. Gardner, Elizabeth G. *Convalescent Care in Great Britain*. University of Chicago Press, 1935.
5. Potter, Ellen C., Howell, Laura, and Lockwood, Marion. Inspection and the Power of License as Tools in the Care of the Chronically Ill. *Public Welfare*, Apr., 1944.
6. Potter, Ellen C., Howell, Laura, Lockwood, Marion, and Dowdell, Marc. How Can a Program for the Care of the Chronically Ill and Aged Be Integrated? *Public Welfare*, Nov. and Dec., 1943.
7. Jarrett, Mary C. *Chronic Illness in New York City*. Columbia University Press, 1933.
8. New York State Health Preparedness Commission. *Report on Licensure of Nursing Homes in Other States*, 1946.
9. Wagner, Margaret W. Meet Yourself at Sixty-Five. *Survey Midmonthly*, 82:108 (Apr.), 1946.
10. Gorrie, Kathleen. Life Begins at Forty Plus. *Survey Midmonthly*, 82:113 (Apr.), 1946.
11. Stone, Allen. Planning for the Chronically Ill. *Survey Midmonthly*, 82:111 (Apr.), 1946.

---

#### A.P.H.A. MEMBERSHIP DIRECTORY

The 1946 Membership Directory of the Association is at last a reality and every member is entitled to receive it without charge. Members who desire to receive a copy should send a post card or a letter to this effect to the Association office at 1790 Broadway, New York 19, N. Y.

# Problems of an Aging Population\*

## Preventive Aspects of Cancer Control

HERBERT L. LOMBARD, M.D., M.P.H., F.A.P.H.A.

*Director, Division of Cancer and Other Chronic Diseases, State Department of Public Health, Boston, Mass.*

OVER thirty years ago the first cancer control measures in the United States were inaugurated. Starting as a project of a few individuals, the movement has expanded until, at the present time, its recognition as a public health problem is indisputable. This third of a century has witnessed an increasing interest in the cancer problem, a better knowledge of the disease, and a decline in the female age adjusted death rate. At this time it seems pertinent to review the accomplishments of this period inasmuch as cancer control is entering an era of expanding activity caused by an accumulation of events; namely, the closing of the war, grants-in-aid to states of funds identified by Congress for cancer control, the intensive drive of the American Cancer Society, and the interest in the atomic discoveries and their relation to cancer, together with the popular belief that, given sufficient funds, science can conquer even cancer. This review of progress in cancer control depicts accomplishments from which certain patterns for future guidance have emerged.

### RESEARCH

Thirty years ago chronic irritation was considered the major factor in carcinogenesis. The earlier works on heredity in animals had appeared, and two Japanese scientists had just proved that cancer could be produced by the

products of combustion of coal. It was known that the incidence of cancer increased with age, that it could occur in any part of the body, and had certain geographical predilections, such as the rarity of breast cancer in Japan, and the high incidence of stomach cancer in Switzerland.

Since 1915 fundamental research has expanded along the lines of genetics, hormones, biophysics, carcinogenic chemicals, cell growth, and viruses. Knowledge today is far in excess of that in 1915, but extensive study is still required. With the expanding research programs of the U. S. Public Health Service, the American Cancer Society, and other organizations, knowledge regarding the disease will continue to increase, and there is a strong probability that improved means of prevention will be discovered.

### CANCER CLINICS

The facilities for diagnosis and treatment of cancer have been extended and their utilization has been increased. Three hundred ninety-two cancer clinics were approved by the American College of Surgeons in 1945. This is far short of the number proposed by the National Advisory Cancer Council, one for every 50,000 individuals, but is a great improvement over the few clinics at the beginning of the century. Approval by the American College of Surgeons entails clinical facilities, including radiation, social service, and an adequate record system. The staff should include representatives of all the hospital

\* Presented before the Health Officers Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 14, 1946.

departments concerned with the diagnosis and treatment of cancer, and should meet for regular conferences on individual cases. Clinics that merely diagnose and treat patients are neglecting a major service to the profession, namely, that of making available the great wealth of data which should be collected and utilized. Many clinics fail to do this because they lack personnel trained in the collection and analysis of data.

One of the recent innovations of cancer service is a clinic intended to furnish physical examinations for well individuals. There has been considerable discussion regarding the name of this type of clinic. It has been called the prevention clinic, the detection clinic, and the case finding clinic. None of these seem to describe exactly the service offered. The discovery of precancerous lesions is a preventive service. The detection of early cancer among symptomless individuals might be classified as either detection or case finding, but so also could be the finding of early cancer among individuals who present symptoms. Moreover, reports of the prevention clinics indicate that many of their patients have definite symptoms. Such patients should go to a diagnostic, rather than a prevention clinic.

Over the years some of the Massachusetts clinics have functioned like prevention clinics, with the exception that no effort was made to have symptomless persons attend. About a third of the patients have cancer, a sixth benign tumors or precancerous lesions, and a twentieth have no pathology. The remainder, comprising the large bulk of individuals attending the clinics, have non-malignant conditions. The small percentage of individuals with no pathology is probably due to the fact that about 85 per cent of all clinic patients have been referred by their family physicians. This Massachusetts experience suggests one method of furnish-

ing prevention clinic service by broadening the scope of the present diagnostic clinics.

#### CANCER CONTROL PROGRAMS

The cancer clinic is but one part of an integrated cancer control program. Other activities include statistical research, education, hospitalization, and the diagnosis of pathological tissue.

Twenty-three years ago Dr. Eugene R. Kelley presented a paper before this Association in which he pointed out the following requirements of cancer programs:

1. The great need of discussion and study by health department administrators to determine just what their proper niche is in the cancer struggle.

2. The need of better statistical data as to the present facts and the need of additional personnel and funds for health administrators adequately to collect, collate, analyze, and diffuse these facts.

3. The need of more extended facilities for early diagnosis and of stimulating the professions to utilize fully these facilities when established.

4. The need of better hospital facilities for the inoperable group of cancer victims.

5. The supreme and pressing need of new and efficient methods of both arousing and retaining public interest in and understanding of the significance of cancer whereby a large degree of success may be reasonably anticipated even with our present faulty weapons for combating the menace of malignancy.<sup>1</sup>

At that time there were no state cancer control programs. Today nearly half the states have programs, but the needs which Dr. Kelley discussed are still not met.

The ideal of any cancer control program is the prevention of the occurrence of the disease, but unfortunately the number of cases that can be prevented by active measures is limited. This is due in part to a lack of scientific knowledge and in part to a lack of public receptiveness to known facts. While there is an association between cancer and both physical and chemical carcinogenic agents, it is difficult to induce in-

dividuals to accept and apply this knowledge. For instance, it would be impossible to convince everyone to avoid tobacco or to be protected from the actinic rays of the sun by wearing veils. Also, while the removal of all moles would doubtless prevent a certain number of cancers, the health officer would be loath to advocate a wholesale removal of them when he realizes that nearly every person has one or more and that only a small percentage of moles ever become cancerous.

Even if campaigns against chronic irritations and precancerous lesions were far more effective than they are at present, the number of cancers that could be prevented by such endeavors would be relatively small. There is, however, the probability that certain cancers can be prevented in an indirect manner. In the *Decennial Supplement of the Registrar-General of England and Wales* it was shown that a group of cancers including those of the skin, mouth, uterus, esophagus, larynx, and stomach were more prevalent among the poor than among the rich.<sup>2</sup> It was felt that if the economic level could be raised the cancer rates of these sites would be lowered. Massachusetts figures show some confirmation of this hypothesis.

In recent years, coincidental with a rise in the standard of living, this group of diseases has shown a downward trend, and the individual diseases composing the group have shown either a downward trend or no trend.<sup>3</sup> Prevention by improving the standards of living could not be considered the result of planned effort on the part of either the health officer or the individual, but would be an indirect or a passive method of prevention.

At the present time, however, the administrator of a cancer control program concentrates his major efforts on the prevention of death rather than on the prevention of the disease. This resolves itself into early recognition and ade-

quate treatment, and requires prompt action on the part of both patient and physician. The patient should consult a physician as soon as symptoms are noted. The physician should recognize the condition without delay, and unless he is skilled in the treatment of malignant tumors he should seek consultation or refer the patient to a special clinic. Thus with our present state of knowledge an effective cancer control program must depend largely on early diagnosis and adequate therapy.

With the increase in the number of states inaugurating cancer programs it has become apparent that different methods of attack are necessary. A populous community on the east coast will need an entirely different technique from that applicable in a rural community in the midwest. Moreover, the special interest of the administrators is a factor in the choice of a program. Nurses and social workers are particularly interested in the facilities for care of patients, and their contact with the advanced cancer patient spurs their humanitarian instincts. The physician is primarily interested in the clinical aspects of the disease, but even in this profession the different specialties alter the point of view. The surgeon, the radiologist, the pathologist, the general practitioner, all have different ideas regarding the best method of approach to the cancer problem, while public health officials have a still different point of view. Fortunately, a considerable amount of originality has been used in conducting the cancer programs in the different states. New York places particular emphasis on reporting of cancer; Connecticut specializes in a cancer registry; Missouri has built its program around the Ellis Fischel State Cancer Hospital; West Virginia has reached into its most rural communities with its cancer services; while Massachusetts has devoted especial attention to statistical research.

## EDUCATION

The beginnings of cancer education may be said to have occurred when a committee of the American Medical Association in 1905 reported in favor of educational work in cancer, and as a result various pamphlets on cancer control were published.<sup>4</sup> In 1909 the Cancer Commission of the Medical Society of Pennsylvania was organized and its report in the following year focused attention on delay in receiving cancer therapy.<sup>5</sup> The Clinical Congress of Surgeons of North America appointed a cancer committee which in 1912 secured the publication of popular articles on cancer in several widely read magazines.<sup>4</sup> In 1913 the American Society for the Control of Cancer was organized, and from that time to the present has had great influence in the cancer control movement.<sup>4</sup>

The objective of cancer education is the dissemination of sufficient information to generate action if necessary. Education has been conducted by federal, state, and local official organizations, the American Cancer Society, and the medical profession. Professional education has been offered through the medical schools, medical societies, free distribution of books and periodicals to physicians, graduate courses, cured cancer clinics, and teaching clinics. Lay education has consisted of magazine and newspaper articles, public addresses, radio presentations, motion pictures, lantern slides, posters, pamphlets, bulletins, and various exhibit material.

In Massachusetts an educational program based largely on talks by local physicians has been in operation for over ten years. Recently these have been augmented by institutes for the interchange of committee ideas regarding cancer education, school programs as an indirect method of parent education, and house-to-house surveys as an evaluative measure of present knowledge and an opportunity to impart further infor-

mation. Many years ago Dr. Bloodgood stated that cancer lectures, especially to women, are the best means of educating the public.<sup>4</sup> A survey of some ten cities in Massachusetts has confirmed the value of this type of education. Next in importance to the spoken word in educational value was the written word, while only a few individuals mentioned visual aids as a source of knowledge. It seems apparent that visual aids have not been particularly important in cancer education in Massachusetts, either because of poor choice of material, insufficient use, or because their intrinsic value is negligible.<sup>6</sup>

## OCCUPATIONAL CANCER

Considerable knowledge has accumulated regarding cancer in industry. It is known that some industrial cancers may be prevented by the use of building materials which prohibit the absorption of carcinogenic substances, and by the utilization of safety devices to protect the workers, but such installations depend upon the foresight of the management rather than upon the initiative of the individual. Hueper has stated:

Whenever the managers of new plants and their medical advisers have neglected to profit, in the construction and operation of their establishments, from the adverse experiences previously had by other manufacturers in the same fields, there has appeared some ten to fifteen years later a renewed, acute and sometimes epidemic-like occurrence of occupational cancers in these industries. . . . Although today a great deal of evidence on the causes of occupational cancer and the conditions under which it develops is available, relatively little effort has been made to spread this knowledge among parties who are vitally concerned with this information, namely the managers and physicians of industrial concerns, although they carry the main load of controlling this preventable type of cancer. This situation is the more deplorable because the present rapid development of industry tends to extend the hazards of the known industrial carcinogenic agents while at the same time creating new ones which may cause the appearance of cancers ten to twenty years hence, unless concerted efforts are made in time to discover



and control such dangers by appropriate countermeasures.<sup>7</sup>

#### PATHOLOGICAL SERVICE

The rise in tissue diagnosis service deserves mention. Pathological service in hospitals has greatly increased and many states are furnishing tissue diagnosis service to physicians. It is felt that the diagnosis of specimens submitted to the laboratories, while of immediate concern, is only one aspect of the function of the tumor diagnosis service, since the material submitted can be used also for histologic and statistical studies.

In Massachusetts a grant from the Commonwealth Fund has made possible a three year study to determine the possibility of including in the service furnished by the pathological laboratory the examination of vaginal smears for diagnosis of uterine cancer by means of the Papanicolaou and Traut technique. Preliminary findings indicate that perhaps one out of every four hundred women with no gynecological symptoms has uterine cancer, while a much larger percentage of those with gynecological symptoms are found to have cancer of that organ.

#### HOSPITALIZATION

Only a few states have included cancer hospitals in their control programs, but even in these states the greater part of the cancer load is carried by other hospitals. In Massachusetts less than 5 per cent of cancer cases are cared for in the two state cancer hospitals. The trend of expansion in service is largely at the local hospital level, not only for the cancers that offer hope of cure, but also for the far advanced cases.

While the present trends indicate that there will not be many state cancer hospitals established, and that adequate service for the patient can be maintained through local institutions, it is

pertinent to point out one outgrowth of the cancer hospital program in Massachusetts. During the 19 years in which Pondville Hospital has operated, 118 doctors have been graduated after one to two years' residency. These men had all interned in other institutions before coming to Pondville and at the conclusion of their stay at Pondville were not only proficient in the diagnosis and treatment of cancer but were, for the most part, interested in the entire control program. Nearly half of them have opened offices in Massachusetts communities and the remainder in nineteen other states and four foreign countries. This infiltration of trained cancer personnel augurs well for better cancer service.

#### STATISTICAL RESEARCH

Statistical research has greatly augmented cancer control programs. Data for study have been collected from death records, hospital records, clinic records, morbidity reports, surveys, and questionnaires. Three main types of study have been made: one dealing with causation of the disease, a second dealing with program management, and a third with evaluation of a program. An example of the first is found in Levin's study of the association between syphilis and cancer of the uterus<sup>8</sup>; an example of the second is Macdonald's work on the cancer registry<sup>9</sup>; while an example of the third is the Massachusetts figures which show that a considerable reduction has taken place in the period of delay between first recognizable symptoms and treatment of the disease.<sup>10</sup> Statistical research, which has already done much, will undoubtedly play a leading part in the ultimate prevention of cancer.

#### ACCOMPLISHMENTS

Certain measurements of accomplishment are available. The decrease in delay, just referred to, is but one of many. These include such diverse items as in-

creasing attendance at cancer clinics and hospitals, the willingness of the public to listen to cancer lectures, the increasing number of magazine articles on cancer, the large number of individuals willing to work for cancer control, and the rapidity with which new state programs have been organized. Probably the most important measurement is obtained in the changing death rate. In the early part of the century the adjusted cancer death rates for both sexes were rising about 2 per cent per year in both the Registration Area of 1900 and Massachusetts. Shortly before this country entered the First World War the increase among females lessened, somewhat more in Massachusetts than in the Registration Area. A change occurred in males around 1926 for both Massachusetts and the Registration Area. From then on the annual percentage increase was only about one-half its previous value. In the middle 30's, a downward trend was noted in Massachusetts among females and a few years later a similar drop occurred in the Registration Area of 1900. Due to the aging of the population the crude rate for both sexes is still increasing. The change in the adjusted cancer death rate offers thought for speculation as to what part of it may be attributed to cancer control activities and what part to other causes.

#### FUTURE CANCER CONTROL

The basic plan for future cancer control is apparent, and will include expanding clinics, hospital facilities, pathological service, statistical research, and education. The extent of these services and the proportionate effort placed on each is not so clear; and probably geographical location, customs of the people, available finances, and the particular interests of the local administrator will determine this. I feel very sure that progress will be made in many parts of the country. In Massachusetts

our immediate plan for improvement includes several items.

1. We expect to open at least one prevention clinic, and from the experience with this clinic determine the need for others. We are anticipating the possibility of extending the function of our present diagnostic clinics to include a greater number of examinations of symptom-free patients.

2. The results of the vaginal smear study will determine the desirability of extending this service to all physicians.

3. The American Cancer Society is financing a study to determine whether or not certain *habits which cause irritation are associated with cancer*. This study is a continuation of an earlier one financed by the Rockefeller Foundation.

4. It is expected that several more schools will adopt programs of cancer education this year. The extension of school programs will be greatly facilitated by the action of the Committee on Health Problems in Education of the National Education Association and the American Medical Association which has recommended that instruction concerning the nature of cancer, and the known methods of prevention and control, be included in the course of study in high schools.

5. Arrangements are being made to conduct a state-wide survey to obtain pertinent data regarding the disease, somewhat similar to the previous survey conducted in Massachusetts in 1929-1931.

In this brief resumé of a third of a century of cancer control, it seems fitting to pay tribute to those leaders of this movement who are no longer with us but whose efforts have blazed the way for others to follow.

Dr. Joseph Bloodgood—Pioneer in cancer education and surgical pathology

Dr. William Duane—Physicist

Dr. James Ewing—International authority on tumors

Dr. Ellis Fischel—Prime figure in cancer control movement in Missouri

Dr. Jonathan M. Wainwright—Outstanding advocate of cancer control

Dr. H. Gideon Wells—Geneticist in cancer

The following men were from Massachusetts, and because of my close association with many of them I may be too much impressed, but I believe their contributions to be real.

Dr. George H. Bigelow—President of the American Society for the Control of Cancer; organizer and administrator of the Massachusetts Cancer Program

Dr. Walter B. Cannon—Investigator of gastrointestinal physiology by use of the x-ray

Dr. Robert B. Greenough—An outstanding contributor of time, example, and personal effort in the cause of cancer and a proponent of cancer clinics as President of the American College of Surgeons, President of the American Society for the Control of Cancer, and President of the Massachusetts Medical Society

Dr. Frederick L. Hoffman—Pioneer in the collection of cancer statistics

Msgr. Ambrose F. Roche—Background figure in the establishment of the Massachusetts Cancer Program

Dr. John Collins Warren—Organizer of the Harvard Cancer Commission

In closing, it seems pertinent to quote from another cancer pioneer, the late Dr. J. W. Schereschewsky of the United States Public Health Service:

That the cancer death rate will continue to increase in the future as it has in the past is not to be supposed. Physical, chemical, and biologic processes all tend to a state of equilibrium. So in the case of cancer, when the forces which are tending to raise the human race to a new and higher level of susceptibility have spent themselves, we may expect no further increase in the rate, at least from the operation of these causes, and, lying

concealed in these evils, as in Pandora's box, there is still the hope in the hearts of the medical profession and of the students of the public health that tomorrow, next month, or next year the true defense against this relentless foe will be vouchsafed to us.<sup>11</sup>

#### REFERENCES

1. Kelley, E. R. Cancer and the Health Administrator. *A.J.P.H.*, 14, 7:561 (July), 1924.
2. *The Registrar-General's Decennial Supplement, England & Wales, 1931. Part IIa. Occupational Mortality (Registrar-General's Statistical Report)*, London, 1938.
3. Potter, E. A. The Changing Cancer Death Rate. Presented before the Cancer Symposium, in association with the Seventy-fourth Annual Meeting of the American Public Health Association, Cleveland, Ohio, November 11, 1946.
4. *The American Society for the Control of Cancer: Its Objects and Methods and Some of the Visible Results of Its Work*. New York, 1925.
5. The Commission on Cancer to the House of Delegates, October 6, 1924, Report of. The Medical Society of the State of Pennsylvania. *Atlantic Med. J.*, Sept., 1924.
6. Potter, E. A. Small Sample Surveys as Adapted to a Cancer Program. *A.J.P.H.*, 36:10 (Oct.), 1946.
7. Hueper, W. C. Industrial Management and Occupational Cancer. *J.A.M.A.*, 131, 9:738 (June 29), 1946.
8. Levin, M. L. Cancer Reporting in New York State. *New York State J. Med.*, 44, 8:880 (Apr. 15), 1944.
9. Macdonald, E. J. The State-Wide Cancer Record Registry in Connecticut. *Med. Woman's J.* (Apr.), 1944.
10. Potter, E. A., and Tully, M. R. The Statistical Approach to the Cancer Problem in Massachusetts. *A.J.P.H.*, 35, 5:485 (May), 1945.
11. Schereschewsky, J. W. The Course of Cancer Mortality in the Ten Original Registration States for the 21-Year Period, 1900-1920. *Pub. Health Bull.* 155:71 (June), 1925.

# Problems of an Aging Population\*

## Public Health Aspects of Diabetes

HUGH L. C. WILKERSON, M.D., M.P.H.

*Surgeon, U. S. Public Health Service, Boston, Mass.*

DIABETES is a major public health problem which is increasing in importance. It has rapidly advanced in rank as a cause of death from twenty-fifth place in 1900 to ninth place in 1940.

When one considers the public concern about such diseases as tuberculosis, cancer, and anterior poliomyelitis, diabetes appears as a relatively neglected disease. Probably to a greater extent than cancer or heart disease, diabetes is amenable to definite methods of control by using the presently accepted knowledge of its cause, diagnosis, treatment, and complications. There is a growing recognition of the challenge this problem presents for organized community effort: to identify early cases; to attempt to prevent the disease, particularly among those susceptible by heredity and by obesity; to prolong the lives of diabetic patients; and to lessen the national economic burden produced by its complications. The situation calls for concerted action.

In 1924 Haven Emerson<sup>1</sup> pointed out that diabetes incidence and mortality had increased more rapidly than the incidence and mortality of any other recorded disease for the preceding 50 years. The United States Bureau of the Census<sup>2</sup> has reported that among the causes of death which showed an up-

ward trend from 1921 to 1940, diabetes ranked second. Statistics indicate that great progress has been made in reducing the death rate from many other causes since 1900, particularly the infectious diseases, among which only tuberculosis, pneumonia, and influenza stand above diabetes. Figure 1 shows those causes responsible for a larger number of deaths than diabetes in 1940 in the United States.

In eleven states diabetes is responsible for more deaths than is tuberculosis; for the country as a whole, it causes one-third more deaths among white women than does tuberculosis. These comparative figures illustrate the need for an active program to prevent and control diabetes.

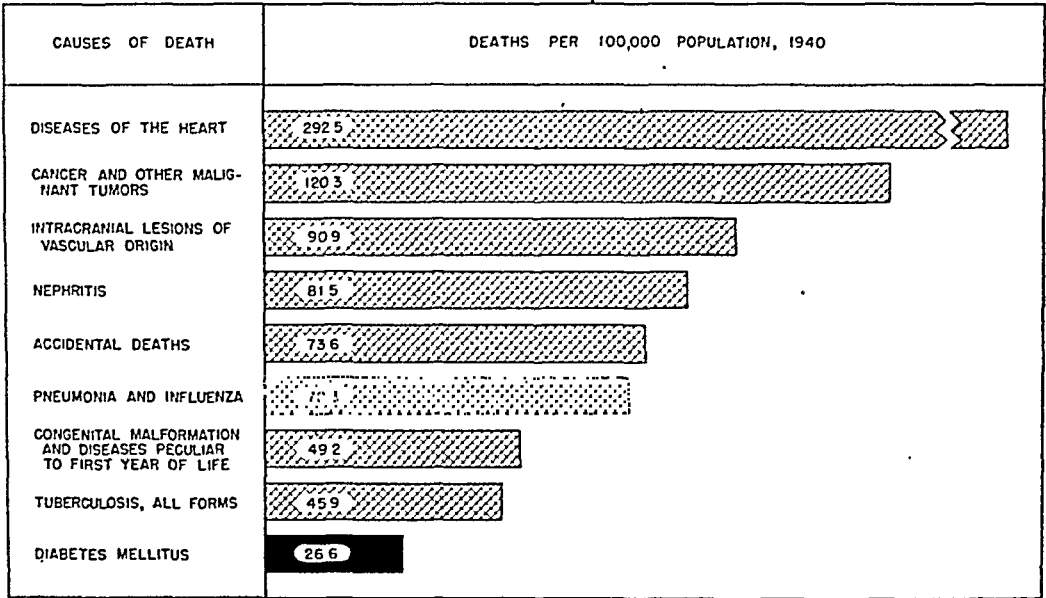
The need for informing the public about the problem of diabetes appears unusually great when we consider that for the conservatively estimated 660,000 cases, according to Dublin<sup>3</sup> of the Metropolitan Life Insurance Company, voluntary health agencies collect only \$30,000 a year, or 5 cents a case, as contrasted with the excellent public response to tuberculosis control, for which it is said voluntary agencies alone collect annually \$15,000,000, or \$22 a case.

Figure 2 shows the proportion of total mortality caused by diabetes. In 1920 diabetes was responsible for 1.2 per cent of all deaths; by 1940 this proportion had risen to 2.5 per cent. The age group at which diabetes is charged with

\* Presented before the Health Officers Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 14, 1946.

FIGURE 1

THESE CAUSES WERE RESPONSIBLE FOR A LARGER NUMBER OF DEATHS THAN DIABETES IN 1940 IN THE UNITED STATES

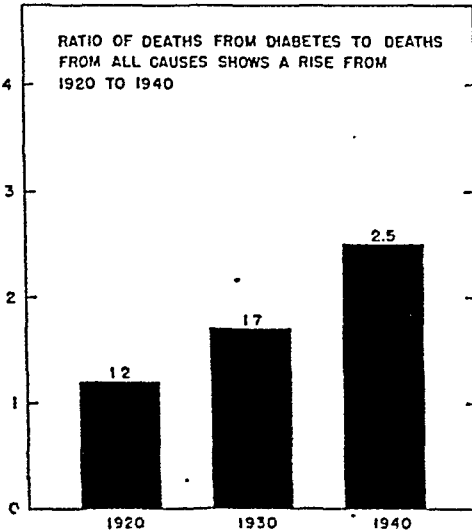


SOURCE: Vital Statistics Rates in U.S., 1900-1940. Table 15 U.S. Bureau of the Census

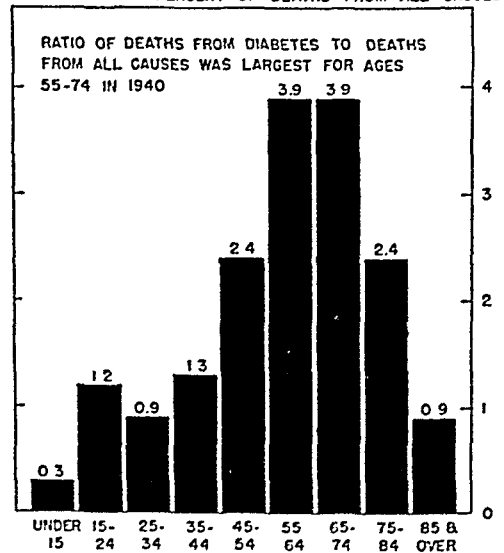
FIGURE 2

PROPORTION OF TOTAL MORTALITY CAUSED BY DIABETES

PERCENT OF DEATHS FROM ALL CAUSES



PERCENT OF DEATHS FROM ALL CAUSES



Based on mortality statistics published by U.S. Bureau of the Census

the largest proportion of deaths is that between 55 and 74 years. In 1940 the disease was reported as responsible for 3.9 per cent of total mortality in this age group.

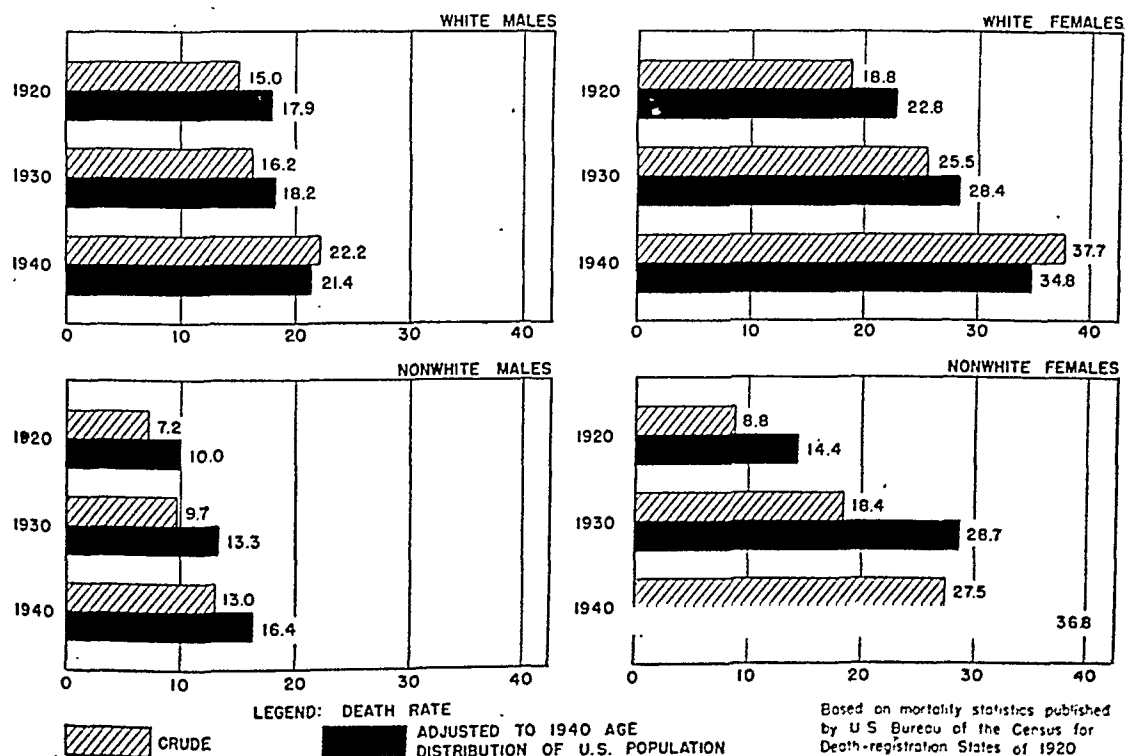
Diabetes death rates show an upward trend for both men and women, white and non-white, for the period 1920 to 1940 (see Figure 3). Adjustment for age on the basis of the population in 1940 reduces the rates of increase, but does not account for the increase in the period. The greatest per cent increase in age-adjusted rates has occurred in the case of non-white women—from 14.4 to 36.8 per 100,000—an increase of 155.6 per cent. For white females the corresponding increase was from 18.8 to 34.8 per 100,000, an increase of 52.6 per cent. The increases among men are less than those noted among women; the smallest rise is 19.6 per cent for white men when adjusted for age.

In forming a concept of the actual mortality among diabetics it should be remembered that mortality statistics are not wholly reliable, partly because insulin treatment allows the underlying diabetes to be overshadowed by other causes of death in the Census reporting. This tendency will become even more pronounced as deaths from diabetic complications are reduced further. For example, investigation by Joslin and Lombard of 744 diabetic patients previously treated by Joslin disclosed that only 62.9 per cent were classified as diabetic on the death records.<sup>5</sup> These findings having been confirmed it is concluded, therefore, mortality figures are inadequate in showing the number of deaths among diabetics.

To bring about the consummation of a plan of control there must be a greater realization of the prevalence of diabetes by the public and by the medical profession. There must be a wide acquaint-

FIGURE 3

### DEATH RATES FOR DIABETES SHOW INCREASES FOR ALL RACES AND BOTH SEXES FOR THE PERIOD 1920-1940



ance with the important facts concerning the incidence of the disease and its distribution by age, sex, race, marital status, and occupation, as well as a knowledge of its socio-economic importance. Such information is indispensable in organizing a community's resources for control of the disease.

#### INCIDENCE

Diabetes is not a reportable disease and, therefore, its incidence is not accurately known. The number of people who have the disease in the United States today has been estimated as 660,000 on the basis of the National Health Survey made by the U. S. Public Health Service in 1935-1936,<sup>4</sup> which survey was directed only toward finding the number of known cases in a given number of people. Other estimates of the number of cases today exceed one million.<sup>5</sup> According to the findings of the National Health Survey, the number of men with diabetes was 2.7 per 1,000; the number of women, 4.5 per 1,000. It has been estimated that if the prevalence rates discovered in the survey prevailed in the general population during 1940, over one-quarter of the total diabetics were under 50 years of age, one-quarter between 50 and 60, and a little less than half were at the age of 60 and over. The average age of male diabetics was 55.6 years, and that of females, 56.7 years.<sup>6</sup>

More recent investigations based upon findings of physical examinations involving urinalysis reveal an incidence of diabetes higher than that which might be expected according to the National Health Survey.

Physical examinations at local Selective Service Boards and Induction Stations from April, 1942, to December, 1943, disclosed that the prevalence of diabetes among registrants was 2.6 per 1,000 examined—more than twice as high as that recorded in the National Health Survey for men of approximately

the same age group. The rate of overweight recorded for Selective Service registrants was high, and this is significant in the problem of diabetes, because clinical statistics demonstrate that an overweight person with diabetic ancestors is a likely candidate for diabetes.

The Federal Security Agency made a study of the health records of 150,000 NYA youth examined in 1941, boys and girls from 16 to 24 years of age.<sup>7</sup> It is noteworthy that the NYA included only the low income group, because there is some contention that diabetes incidence rates are low in that group. However, the diabetes prevalence among NYA youth aged 16 to 24 was found to be 1.2 per 1,000—while the National Health Survey recorded a rate of only 0.59 cases per 1,000 persons aged 15 to 24.

In a survey in Arizona, where there was a very low recorded mortality rate of diabetes, Joslin found a prevalence of diabetes comparable to that of the National Health Survey.<sup>8</sup> Of like significance to public health and preventive medicine is the fact that 78 per cent of newly discovered diabetics in a study at the Boston Armed Forces Induction Station had no knowledge of their condition.<sup>9</sup> Wherever investigations have been made by means of physical or laboratory examinations, a prevalence of diabetes has been discovered significantly higher than that recorded in the National Health Survey. This is strong evidence in favor of organized case finding programs to discover unknown cases of diabetes by means of urine and blood tests for sugar.

A demonstration case finding program has begun in Oxford, Mass., a typical semi-rural New England town of about 5,000 cosmopolitan population, in October, 1946, by the U. S. Public Health Service Diabetes Demonstration Unit. The object is not only to obtain valuable epidemiological data, but also to

provide a pilot study for diabetes case finding. The proposal to attempt finding all the mild and undetected diabetics in the town and placing them in the care of their physicians was first discussed with state and local health and medical groups, and then presented to the civic leaders of the town. Interest in the program has steadily mounted, and co-operation of the social and civic groups in the endeavor has been outstanding. The school children, guided by the school and district health nurses, have responded well by bringing requests for the tests from their parents. Public health personnel carrying on the work of the survey consists of a public health officer, technicians, health educator, a clerical staff, and coöperating local and district health nurses. Identifying data including age, sex, color, nationality, weight, height, and history of diabetes, as well as the results of blood and urine analyses for sugar, are being recorded for each individual. Abnormal laboratory findings will be rechecked carefully with glucose tolerance tests and the patients referred when indicated to their doctors, who will receive a copy of the laboratory findings. In so far as possible, collection of blood and urine specimens is timed to follow an average full meal. In this way very few mild diabetics would be missed, and the screening will be more complete.

Whether we have a truly increased incidence of diabetes, or whether the advancing age of the population and increased duration of the disease produce a cumulative effect, it is expected that the number of diabetics in the United States will increase by 18 per cent from 1940 to 1950, while the total population may grow by only 9 per cent. By similar deductions, our total population about 1985 will reach a maximum, which will be 22 per cent greater than it was in 1940; however, in the same interval of time the number of diabetics may increase by 74 per cent.<sup>6</sup>

#### AGE OF ONSET

Barach's<sup>10</sup> analysis of the age at onset of 1,000 cases of diabetes shows that, while the disease makes its appearance at all ages, the onset is most commonly between the ages of 50 and 55 (sixth decade). Joslin<sup>5</sup> also shows the maximum susceptibility is in the sixth decade for both males and females. The considerable incidence of the disease in childhood, adolescence, and early adult life, as well as the declining susceptibility in the later decades, indicates that diabetes should not be called a disease of old age.

#### SEX

Sex appears to be a determining factor in diabetes incidence and mortality, because an excess mortality in women as compared with men is characteristic. Up to the age of 35, female mortality rates are about the same as those for men, but after age 45 there begins an appreciable excess in the female rates. The maximum proportionate difference occurs at ages 55 to 64.

#### RACE

It is proverbial that diabetes is more prevalent among Jews than among Gentiles. More recently, however, data have shown an unusually high incidence among the Irish. At one time Negroes appeared to have very little diabetes, but today the mortality among the whites is only a little higher than among the Negroes when rates are adjusted for age.

#### MARITAL STATUS

Figure 4 shows the death rate per 100,000 persons for diabetes by sex and marital status in the United States in 1940. Age adjusted death rates on the basis of marital status indicate that the highest mortality occurs among married women and those who have been married. The rate for married women is nearly twice that for single women, and

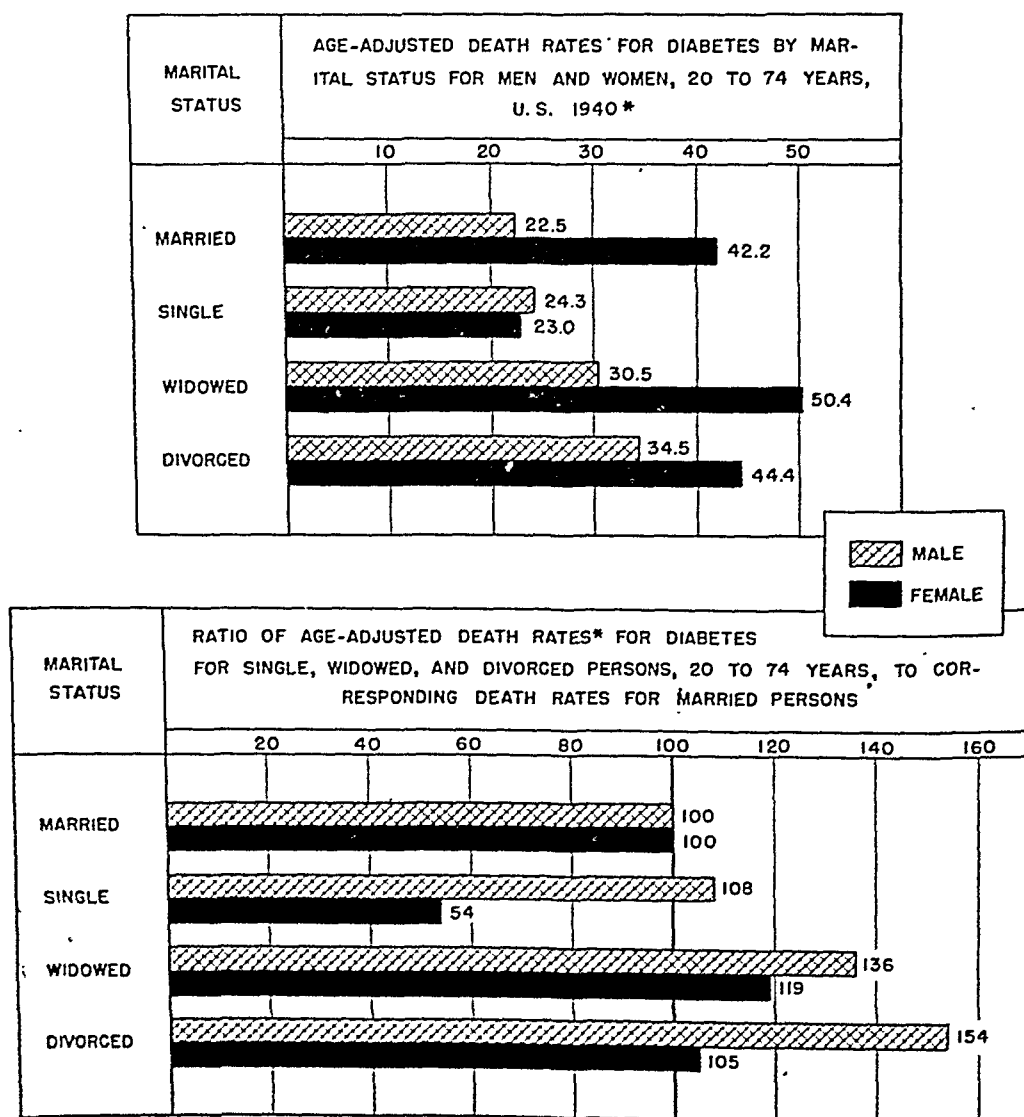


nearly twice that for married men. The death rates for widowed and divorced women are still higher. On the other hand, the diabetes death rate for married men is the lowest of the marital group compared with rates for single, widowed, and divorced men.

Joslin<sup>5</sup> attributes the higher death rates for married women primarily to over-feeding and under-exercise during and after pregnancy, resulting in overweight. Among a group of married women examined with onset of diabetes after 45, the average weight was 180 pounds as

FIGURE 4

### DEATH RATES PER 100,000 PERSONS FOR DIABETES BY SEX AND MARITAL STATUS: UNITED STATES, 1940



\* Obtained by applying age-sex-specific death rates for the marital class to the population of the U.S., 20 to 74 years of age in 1940\*

SOURCE: Deaths from Selected Causes by Marital Status, by Age and Sex, United States, 1940, Vol. 23, No. 7; U.S. Bureau of the Census

compared to only 160 pounds for a group of single women.

#### OCCUPATION

It seems the occupational and economic status of an individual affects his chances of becoming diabetic only inasmuch as it results in lessened physical activity, overindulgence in food, and conditions that favor obesity. Almost all authorities accept the rule that liability to diabetes increases in proportion to the degree a person is overweight.

#### POPULATION SIZE

Comparison of diabetes death rates on the basis of population-size groups demonstrates the predominance of diabetes in large cities in contrast to rural areas.

#### SOCIO-ECONOMIC IMPLICATIONS OF THE DISEASE

If there are 660,000 or more diabetic persons in the country, as reported in the *National Health Survey*, their employment status is of concern to the taxpayers of the nation as well as to the families of the diabetics. Statistics are not complete on this subject, but some indications of the problem were discovered in the *National Health Survey*. About 34,300 diabetics were classified as permanently disabled, on the basis of having been impaired for 12 months prior to the canvass. There were estimated to be about 1,500,000 permanent invalids in the United States. Only five chronic diseases were responsible for more invalids than diabetes, and only ten diseases were responsible for more working days lost. This time lost from work may be considered an index of economic loss. Preventive and educational programs should reach these diabetics and help to salvage those who could become self-sustaining.

Mosenthal<sup>11</sup> has commented on the difficulties which a diabetic often en-

counters in seeking employment in industry, and the common objections to hiring one, such as loss of time from work, insulin shock, occurrence of complications, and vulnerability to traumatic injuries. He believes modern methods of treatment should alleviate most of these difficulties "so that in all probability, the well treated diabetic may qualify on a par with normal persons with regard to longevity and fitness to work in many occupations."

Gates<sup>12</sup> reported a comparatively high incidence of diabetes among employees of a large industry. All employees were given an annual physical examination, including urinalysis. A selected group of 109 individuals believed most likely to have diabetes on the basis of family history or sugar in the urine were given glucose tolerance tests. As a result of the tests, 17 were classified as diabetics (in addition to 3 known diabetics); and 19 persons were classified as "potential diabetics." The newly discovered diabetics will have their period of usefulness to industry extended and they will be able to prolong their lives.

#### PREDISPOSING AND PRECIPITATING FACTORS

In consideration of the causes of diabetes, numerous authorities have presented significant evidence that heredity and obesity are outstanding. Evidence is accumulating that the disease is handed down through generations as a recessive Mendelian characteristic. The accepted theory of heredity in diabetes indicates that every child is born with or without a diabetic hereditary predisposition, and as the hereditary trait is recessive, the disease may skip a generation. Numbers of people predisposed can go through life without developing the disease in its clinical form, either because they do not live to the age at which it develops to the stage of presenting clinically recognizable symptoms,

or because by chance or good care they avoid precipitating causes, such as obesity.

The hereditary tendency in diabetes was noted as far back as the 7th century A.D., and has been considered paramount as a cause by many authorities. Joslin cites evidence of a family history of diabetes in 55 per cent of a group with diabetes of 20 years' duration with onset in childhood. In his oldest age group, 75 years and over, it is 29 per cent. In a group of childhood cases of Jewish parentage, a family history of diabetes was cited in 49 per cent. Blotner and Hyde,<sup>9</sup> in their studies of selectees found a family history of diabetes in 32 per cent of one diabetic group and 43 per cent in another.

Not all fat people become diabetic, but in a person who is susceptible to diabetes, obesity may be the exciting factor precipitating the disease. Studies have shown that diabetes is as much as 8 times as common among persons who are more than 25 per cent overweight as among those of average weight, and less common among those who are average or under the average weight, as measured by standard height-weight-age scales. Barach<sup>10</sup> found in a series of 1,030 diabetics of all ages that 90 per cent had at one time or another in their lives gone through a period when they were obese. Joslin says that from the fourth decade on, 80-90 per cent of diabetics have been overweight on or prior to onset of their disease.<sup>5</sup>

There is a difference of opinion regarding infection as a cause of diabetes, but it is generally agreed that infection may aggravate a latent diabetic state or, as Lukens<sup>11</sup> has said, "act as nature's sugar tolerance test."

There seems to be no good evidence that excess of carbohydrate, protein, or fat, per se, in the diet favors the development of diabetes. It does appear fairly well established that overin-

dulgence in terms of total calories may lead to obesity and therefore predispose to diabetes.

#### DIAGNOSIS

The symptoms of diabetes may bring a person to his physician with a suspicion that he has the disease. The cardinal symptoms of unusual thirst, excessive urination, increased hunger, loss of weight, fatigue, and pruritus should become more generally and better known, so that persons affected would seek medical attention at the onset of these symptoms. Other complaints which often arouse a suspicion of the attending physician are vague neuritic or cramplike pains in the legs, infections slow to heal, frequent boils and carbuncles, extensive pyorrhea, and unexplained impaired vision.

The onset of diabetes is insidious. Except among children it is rarely defined with any degree of accuracy. Our knowledge of the physiological events which take place during the latent stage is very meager. The education of the public, therefore, should stress the importance of routine or regular urinalyses, particularly of those who are relatives of diabetics, obese, and over 45 years of age.

At present the diagnosis of diabetes rests upon the urine and blood tests for sugar. A urinalysis in diabetes is as important as an x-ray in pulmonary tuberculosis. It must be stressed, however, that a diagnosis is not made by a test of the urine alone. There are many people with glycosuria, usually slight in degree, who do not have, nor ever will have diabetes, and it is neither just nor profitable to physician, patient, or public to impose a diagnosis of diabetes unless the disease exists. Sugar found in the urine should be considered as a demand for a thorough check of the blood to prove whether the condition is or is not diabetes. Too often it is mistakenly thought that a little glycosuria

means too great an intake of sweets and, consequently, an early diabetes gradually becomes advanced and finally severe complications force emergency treatment—perhaps too late. For the sake of safety, glycosuria means diabetes until proved otherwise. A blood sugar estimation, however, must be done to make the diagnosis, and once the diagnosis is established, treatment should be prompt and aggressive.

Standards and facilities for diagnosis have improved so that patients can be told that 4 drops of urine and one drop of blood are sufficient specimen material for diagnostic laboratory procedures. Further interchange of ideas will yield more standardization and improvement.

#### PREVENTION AND CONTROL

Before the advent of insulin treatment the average life of a diabetic child was less than 2 years. Now only a few children die of diabetes. Young adults live 4 times as long, and persons over 60 years live twice as long as formerly. From the public health standpoint, the big problem is how much damage is done to vital structures by an unrecognized, prolonged mild diabetic state before frank symptoms develop which bring patients to their physicians for treatment.

Scott<sup>14</sup> has said that if and when all the means of prevention and treatment now known are applied, diabetics will no longer die of diabetes. While medical science has not unraveled all the things we need to know, we do know the facts about the disease that make it amenable to control. We have the instruments with which to work, and a vast amount of knowledge awaits a widespread application.

Failure of the diabetic patient to control his disease is too often due to ignorance of the true nature of the disease and its complications. It must be told again and again to all known diabetics that the span of life and freedom

from complications is dependent upon the patient's utilization of a full and complete understanding of his disease and his adherence to a practical regime of proper diet, prescribed insulin, regulated exercise, and general hygiene.

The family physician sees and treats more diabetics than the specialist, and he thus has a great responsibility. With extensive case finding programs, more early diabetics who are symptomless will place themselves under the care of their family doctors. Among the requirements of effective therapy in diabetes is the indispensable implement—the *sine qua non* of diabetic therapy—the willingness of the physician to dedicate a considerable amount of his own time to full and complete instruction of his patient in the details of self-management of his diabetes, or his coöperation in arranging for instruction and education of his patient by other competent and specially trained professional personnel. There is no effective system of therapy which eliminates the education of the patient.

All hospitals should be equipped and prepared to handle the diabetic emergencies of coma and insulin reactions. For this there will need to be laboratory service available at all hours. Greater still is the need for hospitals for ambulatory patients—new diabetics—where they may live for a week or ten days with other diabetics and learn through lectures, demonstration, study, and practice the fundamentals of the management of the disease. Summer camps for diabetic children should be established in all states as a means of formulating habits of work and play peculiar to a diabetic child, and of utmost importance in a program to improve their well-being and prolong their lives.

The diet to which a diabetic will usually adhere if he understands the reason must be adequate for his needs, palatable, and psychologically accept-

able. In the doctor's office, hospitals, or clinical centers, the dietitian, nutritionist, or the nurse thoroughly trained in the dietetics of diabetes is a valuable assistant to the medical practitioner.

Among the preventable complications of diabetes, coma still occurs, but fear of its outcome is to a great extent conquered by insulin. However, it still occurs far too often with too high mortality. With more and wider dissemination to the public of information about diabetes there should be fewer repetitions of the hospitalization of cases of coma before the diagnosis of diabetes is made. Nine such cases were presented at a clinic recently in one of our larger cities.

Insulin shock in the well educated case usually results from carelessness. Prevention of this complication can largely be accomplished through education and repeated instruction of the diabetic patient.

With increased longevity for diabetics as a result of improved treatment, the most devastating complications are the progressive degenerative changes associated with arteriosclerosis affecting the heart, eyes, kidneys, and lower extremities. Impaired vision progressing to blindness, and amputations necessitated by gangrene produce invalidism in an increasing number of diabetics.

Coöperative clinical research is needed because knowledge is lacking as to all the factors responsible for these complications. Early diagnosis may be the important answer.

Blindness is one of the most devastating complications of diabetes. Of 1,176 blind people in Massachusetts receiving over one-half million dollars in state and federal assistance, Reimer<sup>15</sup> found 3.8 per cent with diabetes recorded as the cause of their blindness. During the last 6 months, the Massachusetts Division of the Blind, technically assisted by the Diabetes Demonstration Office of the U. S. Public Health

Service has been carrying out a diabetes case finding and prevalence study among the blind people in Massachusetts. Postprandial urine and blood analyses for sugar among 880 blind persons revealed 5.3 per cent who were known diabetics. Laboratory tests revealed 2.8 per cent more not formerly known to be diabetic. The individuals in this latter group were referred to their family physicians for medical care.

In order to demonstrate the applicability of public health and preventive medicine in diabetes control, the U. S. Public Health Service Diabetes Demonstration Unit will soon provide a group of professional personnel trained in preventive aspects of the disease as a part of the staff of a local health department in two different geographical locations of the country, one in the South and one in the North. These groups will consist of a public health physician, a public health nurse, a health educator, a nutritionist, laboratory technicians, and a clerical staff. They will assist the local health officer in inaugurating and developing a diabetes control program and will coöperate with voluntary agencies interested in diabetes. All plans will be formulated in consultation with an advisory committee from the local medical society.

The basis, therefore, of a preventive program developed in consultation with the local medical society, would be education of the public in regard to prevention of predisposing causes, recognition of symptoms, and realization of the importance of seeking early diagnosis and adequate treatment in order to avoid complications, prolong life, and increase mental and physical well-being.

It is evident that early discovery will lengthen the lives of those who have diabetes, and may prevent development of the disease in potential or borderline cases.

The possible prevention, therefore, of frank or clinical diabetes by early diag-

nosis in the subclinical stage, and especially among the predisposed, will be stressed in the promotion of a case finding program. The public health doctor and his assistants will organize the community so as to obtain local neighborhood and community sponsors of the program. Urine and blood tests for sugar will be offered to all persons in the community, but emphasis will be placed upon the importance of those having the test done who have a family history of diabetes, are female, married, and above normal in weight. All abnormalities in laboratory reports will be sent to physicians designated by the examinee. Those people who have abnormal laboratory findings will be referred to their family physicians.

If the pilot study in Oxford, Mass., reveals the advisability of doing tests on school children in the attempt to discover signs of pre-diabetes or diabetic tendency, then the younger age group will also be considered for case finding surveys.

Education of the patient and his family will consist of offering assistance to the physician in the instruction of his patient in clinical centers, hospitals, or special arrangements at health departments. Patients would be referred to such centers by their physicians. Instruction would be given in the fundamentals of diabetes control, including adjustment of diet, rôle of insulin administration, regulation of exercise, prevention of complications, and simple methods for performing tests for sugar in the urine. Suitable educational media will be used such as films, film strips, food models, posters, pictures, charts, blackboard illustrations, etc. Information is expected to be disseminated to the general public through the usual media of radio talks, press releases, periodicals, pamphlets, posters, and talks, as well as films before organized groups such as churches, civic clubs, etc.

A coöperative plan will be proposed to the medical society to stimulate and promote more graduate courses in diabetes management for physicians, nurses, dietitians, and auxiliary workers in doctors' offices and in hospitals.

In the field of clinical research in diabetes mellitus, it is hoped there will be coöperative endeavor to arrive at standard criteria for diagnosis and basic principles of treatment. Efforts are being made to encourage more clinical research, and one step in this direction is the recent establishment of a Metabolic Diseases Study Section under the Research Grants Division of the National Institute of Health.

A special attempt is being made to simplify methods for doing blood sugar analyses. The physician needs in his office or in his laboratory a simple, relatively inexpensive apparatus with which he himself, his office assistant, his technician, or his nurse, can take a drop of blood from his patient's ear lobe and in five to ten minutes analyze it for sugar content. This would allow the doctor to make a diagnosis of even early symptomless diabetes on the patient's first visit to his office.

Those conducting public health programs have a responsibility for disseminating information to the public about the habits and conditions of life which are conducive to diabetes. Through case finding, public health organizations might assist in bringing the early symptomless diabetic under the care of his physician. The practising physician, the nurse, the dietitian, and the medical auxiliary workers should be well informed about the treatment of the disease. Above all there should be close coöperation between the practising physician, the patient, and the health worker, in order to attain the common goal of diabetes control.

It is hoped that from the experience gained in the demonstrations which are now being developed, a practical diabetes

program will evolve which will be suitable for the average local health department to consider for integration in its general health program.

#### REFERENCES

1. Emerson, Haven. Diabetes Mellitus—A Contribution to Its Epidemiology. *Arch. Int. Med.*, Nov., 1924.
2. Age-adjusted Death Rates in the United States, 1900-1940. Department of Commerce, Bureau of the Census. Vol. 23, No. 1 (June 1945).
3. Dublin, Lou's I. What Ails Our Voluntary Health Agencies. Metropolitan Life Insurance Company. Dec., 1945.
4. National Health Survey: The Magnitude of the Chronic Disease Problem in the United States. Sickness and Medical Care Series, *Bull. 6*. U.S.P.H.S., Washington, 1938 (rev. 1939).
5. Joslin, E. P., Root, H. F., White, Priscilla, Marble, A., and Bailey, C. C. *The Treatment of Diabetes Mellitus*. Philadelphia: Lea and Febiger, 1946.
6. Spiegelman, Mortimer, and Marks, Herbert H. Age and Sex Variation in the Prevalence and Onset of Diabetes Mellitus. *A.J.P.H.*, 36:26-33 (Jan.), 1946.
7. Federal Security Agency: The Health Status of NYA Youth. Washington: Gov. Ptg. Office, 1942.
8. Joslin, E. P. The Universality of Diabetes. *J.A.M.A.* (Dec.), 1940.
9. Blotner, Harry, Hyde, Robert W., and Kingsley, L. V. Studies in Diabetes Mellitus and Transient Glycosuria in Selectees and Volunteers. *New England J. Med.*, 229:885-892 (Dec.), 1943.
10. Barach, Joseph H. Diabetes and Geriatrics. *Clinics*, 4:5. J. B. Lippincott Co., 1946.
11. Mosenthal, Herman O. Employment of Diabetics—The Diabetic in the Defense Program. *New York State J. Med.*, 42:1558-1560 (Aug. 15), 1942.
12. Gates, Edwin W. Diagnosis of Undetected Diabetes. *Indust. Med.*, 11:387-391 (Aug.), 1942.
13. Lukens, F. D. W. Personal Communication.
14. Scott, J. R. *Diabetes*. New York: Funk and Wagnalls, 1937.
15. Riemer, H. B. C. Topographic and Et'ological Study of 1,176 Indigent Blind Persons in Massachusetts. *Arch. Ophth.*, 32:304-307 (Oct.), 1944.

## Confidential System for Filing True Cause of Death

Beginning on January 1, 1947, the New York City Health Department provided New York physicians with a confidential report form for reporting the true cause of death. Heretofore certain causes such as alcoholism, syphilis, mental disease, tuberculosis, and others have not been reported accurately because of the family feelings or because of the Civil Practices Act which requires that physicians shall not be allowed to give out information learned from a patient under treatment.

Under the new system, two forms will be provided, one for the family which will list the cause of death as from natural causes; the other used in privacy by the doctor will list the true cause. The new system was put into operation after an 8 year trial in the Borough of Manhattan, under the direction of the late Thomas J. Duffield, long-time Director of Research and Sta-

tistics in the department. Its effect upon the vital statistics of the city was immediately noted. In 1939 syphilis deaths increased 35 per cent over 1938, paresis and locomotor ataxia each jumped 16 per cent. Brooklyn Borough had much lower figures for these causes of death, with correspondingly higher percentages of heart and brain maladies.

The new plan was made with the coöperation and approval of the New York Academy of Medicine, the five county medical societies of the city, and the undertakers. In announcing the change, Health Commissioner Weinstein pointed out that public health officers virtually everywhere have known that physicians often withheld the true cause of death, thus introducing inaccuracies into mortality statistics of every country. The one exception is Switzerland which has had a confidential report form since 1926.

# Recent Studies on Disinfection of Air in Military Establishments\*

IN confined spaces occupied by persons, breathing and rebreathing a common air supply, there exists a potential hazard of respiratory infection from air-borne pathogenic bacteria and viruses. One of the objectives of sanitary ventilation is to reduce the risk so far as may be practical without interfering unduly with normal activities, and with due regard for economy. The risk arises from the fact that the environment may become contaminated with microorganisms from infected persons. Some of these organisms may gain access to the respiratory tract of susceptible individuals, giving rise to new infections. The process of removing or inactivating air-borne bacteria and viruses is commonly described by the term "air disinfection."

During the past five years the Office of the Surgeon General of the Army, the Bureau of Medicine and Surgery of the Navy, and the National Institute of Health of the Public Health Service have been actively engaged in studies on "air disinfection." Three methods for reducing air-borne infection in sleeping quarters, barracks and hospital wards have been investigated:

1. Suppression of "dust," particularly through application of oil emulsions to floors, blankets, and bed linen
2. Inactivation of bacteria and viruses in air by ultra-violet radiation
3. Inactivation of bacteria and viruses by germicidal mists or vapors

Before discussing the effectiveness and limitations of these control measures, it will be useful to recapitulate briefly the rationale of air infection and disinfection. Bacteria and viruses of human origin occur in the air in droplets, in droplet nuclei, and in dusts. Droplets originate from secretions of the nose, throat, and mouth. When they are expelled during talking, coughing, spitting, and sneezing, the larger droplets quickly settle out of the air and desiccate on nearby surfaces, including floors, table tops, clothing, and bedding. The smaller droplets lose their moisture by evaporation, and the dried residues, called droplet nuclei, float in the air and drift about with its currents. Dust in the air or on surfaces may receive contamination from droplets and droplet nuclei, or from infected materials such as handkerchiefs, clothing, bedding, bandages of infected wounds, and dressings.

The time of survival of microorganisms outside the human body varies for each pathogenic species, according to environmental conditions, from a few seconds to minutes, hours, days, weeks, and even months. Exact knowledge of the relative importance of the limiting factors, which include temperature, humidity, dust concentration, and light, is meager. The bacteria and virus content of the air in enclosed spaces is constantly being replenished from its occupants and from dust that is stirred up by activities of the occupants and by air currents.

While the objective of air disinfection

\* Report of the Committee on Sanitary Engineering, National Research Council, Division of Medical Sciences, Washington, D. C.



is reduction, removal, or inactivation of pathogenic organisms, the effectiveness of control devices can only be measured indirectly because of technical limitations. Two methods of measurement are available:

1. Sampling the air for all microorganisms that will grow under the conditions of culture, or for specific organisms such as hemolytic streptococci, Group A.

2. Observing and recording the incidence of specific clinical or subclinical infections or cross-infections, occurring in a group of persons or animals living in quarters in which disinfection is in use, and comparing this incidence with that of a control group living in similar untreated quarters. The comparative index may be (1) an infection rate, as determined by bacteriological culturing of nose and throat swabs taken at frequent intervals; (2) a sickness rate including all forms of minor respiratory illness; or (3) a sickness rate based upon hospital admissions for specific respiratory illness.

The second group of methods are both elaborate and time consuming. They require a pooling of skills of engineers, physicists, bacteriologists, clinicians, and epidemiologists. Progress is very slow, as the following review will indicate, and generalizations and inferences must be drawn with great care.

#### DUST LAYING MEASURES.

Dust and lint control is discussed first solely for convenience in presenting the material with a minimum of repetition. Experiments<sup>1, 2, 3</sup> have shown that dust and lint particles, which are normally dispersed by air currents, sweeping, bed making, or walking, greatly reduce the effectiveness of ultra-violet irradiation or the use of aerosols by protecting airborne organisms from the action of these agents.

Practical means for meeting this challenge were first studied by van den Ende and Andrews,<sup>2, 4</sup> and later by the U. S. Navy and Army. In the experience of Naval Medical Research Unit No. 1,<sup>5</sup> droplet-dust particles appeared to constitute the chief source of intra-ward

infections under conditions of war hospitalization. Oiling of floors proved effective and economical in controlling droplet-dust particles for periods of at least two weeks. Scrubbing floors with water or glycols was inferior to oiling and did not offer lasting protection of adequate value. It has been recommended, therefore, that floor oiling be used where practical as a routine sanitary measure, particularly in barracks mess halls, or temporary hospital quarters during short epidemic periods.

The Commission on Air-borne Infections, Army Epidemiological Board, Preventive Medicine Service Office of Surgeon General, U. S. Army, has investigated the effect of oiling floors and bedclothes on the bacterial population of air and on the incidence of acute respiratory diseases in troops. In preliminary experiments at Camp Carson,<sup>6</sup> oiling of floors in barracks with pale paraffin oil reduced the peak of bacterial dispersion by 70 per cent during hours of maximum activity, and treatment of blankets, mattress covers, sheets and pillow cases with an emulsion of medicinal mineral oil, in addition to oiling floors, effected a reduction of 80 per cent in total bacterial counts. Comparable results were obtained in the station hospital wards following application of these measures.

Hospital admissions for respiratory infections at Camp Carson were fewer in a group of 5,750 men living in barracks with oiled floors than there were in a comparable group living in untreated barracks. Oiling bedding as well as floors appeared to be still more promising.

A more extensive study was carried out jointly by the Commission on Air-borne Infections and the Commission on Acute Respiratory Diseases at the Field Artillery Replacement Training Center, Fort Bragg, during the winter of 1944-1945.<sup>7</sup> The floors and bedclothes in alternate barracks of four battalions

were treated with oil,<sup>8,9</sup> and the intermediate barracks were used as controls. These measures lowered the bacterial count by 75–90 per cent and resulted in almost complete elimination of dust. Although hospital admissions from the oiled barracks were fewer in November and December (1944) when the incidence of respiratory disease was low, there was no significant difference in January and in succeeding months when the incidence was high. Acute undifferentiated respiratory disease (ARD) predominated while the prevalence of hemolytic streptococcus carriers remained low throughout the period of study.

It was concluded that "dust suppressive measures were of little practical value in controlling respiratory diseases among new recruits under conditions which were present and for the diseases which occurred during the winter of 1944–1945 at Fort Bragg." Close contact or droplet nuclei seemed to be more important than contaminated dust in the spread of ARD.

Wright, Kruickshank, and Gunn<sup>10</sup> were unable to control the spread of dust-borne hemolytic streptococci in measles wards by oiling floors alone, but they obtained some measure of success by the additional oiling of all bed-clothes, ward-linen, and patients' garments.

More favorable experience has been reported from a British Military unit housing 1,300–1,700 men.<sup>11</sup> Treatment of wooden floors with spindle oil at regular intervals was associated with an incidence of common respiratory diseases of 7 per 1,000 as compared with one of 38 per 1,000 in an untreated control unit.

Good results were also obtained by Feasby and Bynoe<sup>12</sup> of the Canadian Army, working with hemolytic streptococcus infections. A substantially lower carrier rate was observed in barracks in which oiled sweeping compounds were

used as contrasted with barracks that were swept in the usual manner. As a result of this and other studies, a routine order was passed on July 12, 1944, making the oiling of floors mandatory in all Canadian Army buildings.

#### ULTRA-VIOLET IRRADIATION

The bactericidal property of ultra-violet radiation has long been known. Wells and Fair<sup>13</sup> were the first to apply this principle to the disinfection of air in 1933. Since then many important contributions to the literature have been made, notably by Wells, Hart, Wilson, Hollaender, Andrews, Doyle, and others,<sup>2</sup> using upper air irradiation or ultra-violet curtains. Hollaender and his coworkers<sup>14</sup> have recommended the irradiation of air under bunks, and floor dust as well as the upper air.

The physical aspects of ultra-violet disinfection have been discussed by Wells,<sup>15</sup> Buttolph,<sup>16</sup> Rentschler,<sup>17</sup> and others.

#### UPPER AIR AND FLOOR IRRADIATION IN BARRACKS

An extensive study of the efficacy of upper air and floor irradiation in reducing respiratory infections in barracks was carried out at Camp Sampson, New York, during 1943–1945, by the Bureau of Medicine and Surgery, Navy Department with the coöperation of the National Institute of Health.<sup>18</sup>

A self-contained unit comprising 22 two-story barracks was divided into four groups of approximately 1,250 men each. One group was subjected to radiation of high intensity, 235 watts of ultra-violet energy per dormitory of 112 men; and a second to low intensity, 121 watts per dormitory. Third and fourth groups served as controls. Alternate barracks were irradiated and the adjacent untreated barracks were used as controls. In addition to overhead lights, an ultra-violet lamp was installed

under alternate bunks to irradiate the lower air and floor dusts. With a training period of 4 to 6 weeks, 15,000 men were observed in the two test groups and 15,000 in the control group between December 15, 1943, and June 1, 1944.

During this period, hospital admissions for respiratory infections were 25 per cent lower in the group of men exposed to high radiation intensity than in the control group. During the first  $2\frac{1}{2}$  months of the study, when illness rates were high, the difference in admissions averaged 35 per cent. On the other hand, there was no significant difference in hospital admissions from the low intensity group and its control.

Negative results with low ultra-violet intensities have been reported also by Schneiter, *et al.*<sup>19</sup> at the National Training School for Boys, in Washington, D. C., and by Lurie<sup>20</sup> working on the spread of the tubercle bacillus in rabbit colonies through the medium of air.

Bacterial counts in irradiated and control barracks at Camp Sampson showed up to 50 per cent reduction in counts of total bacteria and a significant lowering of beta-hemolytic streptococci isolated from air and dust.

This study was continued during the winter of 1944-1945 with high ultra-violet intensity in all test barracks and with additional floor lamps to irradiate central aisles. The training period was increased to 10 weeks, while the total number of men remained unchanged. The average reduction in hospital admissions during 1944-1945 was about 18 per cent.<sup>21</sup> No definite conclusions were drawn because in January, 1945, sulfadiazine was administered to both irradiated and control groups for 3 weeks as a prophylactic measure against a threatening epidemic of scarlet fever.

#### ULTRA-VIOLET IRRADIATION SUPPLEMENTED WITH DUST CONTROL MEASURES

These experiments<sup>22</sup> too were carried

out at Camp Sampson using 22 barracks of Unit D which housed a maximum of 5,280 men. Floors, blankets, mattress covers, and pillow slips in 15 barracks were treated with emulsified mineral oil developed by Naval Research Unit No. 1.<sup>5</sup> Seven of the "oiled" barracks were equipped with high-intensity irradiation, using ceiling, underbunk, and center-aisle lamps. The remaining 7 barracks served as untreated controls. Each control barrack was sandwiched between an oiled barrack and one which was treated with both oil and ultra-violet light.

Bacterial counts were 75 per cent lower in oiled than in unoiled barracks. Alpha and Beta hemolytic streptococci were greatly reduced in number by oiling, and were practically eliminated from the air by combined action of oiling and irradiation. Most of the organisms were concentrated near the floor and decreased in numbers toward the ceiling.

In comparison with untreated control barracks, hospital admissions for upper respiratory infections during 1944-1945 from barracks in which ultra-violet irradiation was supplemented with oiling of floors and bedclothes were reduced in the same order of magnitude as during 1943-1944. The oiled barracks without irradiation showed a reduction of about 10 per cent. This has not yet been established as a statistically significant difference. The investigators point out that these are preliminary data, not yet acceptable, because the study period was only 3 months; also confusion in the issue of oiled blankets obscured the findings. However, a combination of irradiation with oiling appeared to be promising. The study is being continued at the Great Lakes Naval Training Station.

#### PRECAUTIONS IN THE USE OF ULTRA-VIOLET LIGHT

Direct irradiation of sufficient in-

tensity to kill microorganisms in air is also harmful to the eyes and exposed skin of human beings, particularly to conjunctivae which lack the protection offered by horny cells. Exposure for less than a minute may produce painful conjunctivitis after a latent period of several hours. However, no permanent eye injury has yet been reported in the literature of air disinfection. Much like sunburn, direct radiation on the skin may cause severe erythema and blisters after a latent period of a few hours.

It is therefore necessary to irradiate the ceiling and upper air well above head levels. In particular, must lamps be equipped with baffles that will confine the powerful rays to a region well above or below the normal line of vision. Control of air quality in the breathing zone is then effected by natural or forced circulation which displaces or dilutes contaminated air with irradiated upper air or lower layers. It should be kept in mind that some walls, ceilings, and floors will reflect injurious radiations. Ultra-violet light meters are now available for measuring intensities down to the limits of human tolerance.

The Council of Physical Therapy of the American Medical Association has tentatively recommended that the total ultra-violet intensity of wave length 2537A (including reflection from ceilings, walls, and fixtures in addition to direct emanation from lamps) falling on occupants be not more than 0.5 microwatt per sq. cm. for exposures of 7 hours or less, and not more than 0.1 microwatt per sq. cm. for exposures of 24 hours a day.<sup>23, 24</sup> Responsibility for protecting occupants in irradiated spaces falls largely on lamp manufacturers and installers, who should measure the energy distribution and output efficiency of their fixtures as installed. Periodic testing of energy output and cleaning of fixtures is essential if functional efficiency of installation is to be maintained.

Ultra-violet lamps used for air disinfection may produce ozone in objectionable concentrations, particularly when they are new. If the odor becomes distinctly perceptible the Council recommends increased ventilation.

#### AEROSOLS AND GLYCOL VAPORS

During the influenza pandemic of 1918, Masterman<sup>25</sup> found that spraying the air with dilute solutions of hypochlorites reduced the number of infected particles in the air and apparently lowered the incidence of influenza in crowded cotton mills. Various other chemical aerosols or mists have been tried since 1918 with limited practical success owing to their toxicity, odor, unpleasantness, or destructiveness to fabrics and metals.

#### LABORATORY STUDIES OF GLYCOL VAPORS

The use of pure glycols for disinfecting air was first disclosed by Robertson and his associates<sup>26</sup> working at the Medical School of the University of Chicago under the auspices of the Surgeon General, U. S. Army.

Laboratory experiments<sup>27, 28</sup> in a glass chamber of about 2 cu. ft. capacity, and in a room of 800 cu. ft., showed that concentrations of 1 gm. of propylene glycol vapor in 2,000–4,000 liters of air, or 1 gm. of triethylene glycol vapor in 100,000–200,000 liters of air produced almost immediate and complete sterilization of air into which streptococci, pneumococci, influenza virus, and other organisms had been sprayed. Tests with mouse-adapted influenza virus A on Swiss mice revealed that the glycol vapor protected mice completely against an amount of air-borne virus that killed all control animals.

#### BACTERIOLOGICAL TESTS WITH GLYCOL VAPORS IN ARMY HOSPITALS

Hamburger, Puck, and Robertson<sup>29</sup> carried out preliminary field tests at the Army Hospital at Chanute Field, Ill.

Triethylene glycol vapor in concentrations near the saturation point (0.01 mg. per. lit., moderate fog) reduced the number of air-borne beta-hemolytic streptococci by about 75 per cent in a ward housing patients convalescing from scarlet fever. By injecting steam into the air from the heating system, the relative humidity was kept between 30 and 60 per cent during test and control periods.

In two German measles wards, triethylene glycol vapor lowered the number of air-borne hemolytic streptococci by 60 per cent. Streptococcal cross-infection is reported to have ceased following glycolization, but there were no control data to make sure of this finding.

Failure of glycol to produce rapid and complete sterilization of air in these wards, is ascribed to protective action of dried dusts and lint on which bacteria abound.

A combination of triethylene glycol vapor and dust control was tried out by the same authors<sup>30</sup> in hospital wards at Camp Carson, Colo. Floors were treated daily with a solution of 5 per cent urea, 3 per cent ninol, and 0.1 per cent roccal to hold down dust. Mattress covers, sheets, pillow cases, blankets, pajamas and bathrobes of patients were treated with 2 per cent oil emulsion. Glycol concentration was maintained close to the saturation point with temperatures between 71 and 77° F. and relative humidities of 40-45 per cent.

The combination of triethylene glycol vapor and oiling effected a reduction of 93 per cent in the number of air-borne hemolytic streptococci when the wards were quiet, and 97 per cent during bed-making periods.

Oiling of floors and bedclothes alone, without glycolization of air, reduced the streptococcal count by 86 per cent during bed-making but not at all during quiet periods.

#### EFFECT OF GLYCOL VAPOR ON THE INCIDENCE OF AIR-BORNE INFECTIONS

Preliminary experiments by Harris and Stokes<sup>31</sup> working at the Children's Seashore House in Atlantic City, N. J., under the auspices of the Surgeon General's Office of the Army, have indicated a marked reduction of upper respiratory infection and of total bacterial count during periods of glycolization. The number of patients studied, however, was relatively small; most of the children were bedfast in a supine position; and there was a minimum of direct contact or droplet spread in the wards.

Bigg, Jennings, Olsen<sup>32</sup> tried out triethylene glycol vapor in two similar barracks, each housing 320 men in four dormitories. With a training period of 6 weeks, three groups of 320 men each came under observation in four test dormitories in which the triethylene glycol concentration was maintained between 0.0025 and 0.004 mg. per lit. An equal number of men served as controls in four untreated dormitories. Hospital admissions for "air-borne diseases" during the first and second training periods averaged about 12 per cent lower in the test than in the control group, and there was a marked reduction in the incidence of hemolytic streptococci in throat cultures. Data obtained during the third period were inconclusive, presumably owing to variables introduced by warm weather.

Less favorable results were obtained by the Commission on Air-borne Infections at the Lockheed Aircraft Plant<sup>33</sup> where triethylene glycol vapor was tried out as a prophylactic measure against "colds." Although the male employees of the test group reported fewer colds than did those in the control group, no significant difference in colds was found in females of the two groups. The colds reported by both men and women of the experimental group were

more severe than those reported in the control group. This is ascribed to individual differences of criteria used by examining nurses.

Essentially negative results were reported by Mather and McClure<sup>34</sup> working with propylene glycol in Canadian Air Force Barracks. Concentrations of less than 0.1 mg. per lit. showed little bactericidal action and had no effect on respiratory illness or on hemolytic streptococcus carrier rate. Concentrations greater than 0.1 mg. per lit. proved definitely bactericidal but were impracticable to maintain owing to excessive condensation on windows, walls, doors, despite the unusually mild weather prevailing during the period of the study.

#### IMPORTANT FACTORS IN GLYCOL VAPOR DISINFECTION

Glycols are not chemical disinfectants in the ordinary sense. Their action in air apparently depends on hygroscopic properties and their potency is at a maximum in saturated concentrations. The degree of saturation, rather than absolute concentration is the important factor. According to Robertson,<sup>35</sup> the ideal glycol concentration for air sterilization is one just below the saturation point with low rather than high temperatures and with relative humidities between 40 and 60 per cent. Glycol saturation increases progressively with rising temperature and humidity. Since it is difficult accurately to control bactericidal glycol levels, particularly of triethylene glycol, a moderate fog must be maintained at all times which is likely to cause excessive condensation and produce undesirable psychologic effects.

With propylene glycol, a concentration of 0.3 mg. per lit. (67 per cent saturation) was found decidedly oppressive and the air felt humid and possessed a stale sweetish odor. Considerable condensation of glycol solution occurred

on windows. Paints became sticky after several hours of exposure to this concentration. However, no toxic effects were observed in persons breathing the vapor for a period of 4 hours.<sup>36</sup>

Mather and McClure<sup>34</sup> record similar experiences. With propylene glycol concentrations of 0.2 mg. per lit. or less, heavy condensation occurred and the men complained that the barracks were too warm and stuffy and had a bad odor. Some reported that their throats were sore and dry on awakening in the morning. Overheating of barracks due to unusually mild weather is believed to have been responsible for some of these complaints.

Triethylene glycol has a lower vapor pressure than propylene glycol, and its saturation concentration and possible toxic effects are, therefore, less. In laboratory studies by Robertson,<sup>35</sup> atmosphere saturated with pure triethylene glycol vapor produced no toxic effects on rats and monkeys exposed continuously for about one year. In field studies by Hamburger, Puck, and Robertson,<sup>29</sup> carried out during cold weather, patients readily adapted themselves to saturated concentrations with no harmful or irritating effects during the limited period of study.

When the temperature of the glycolized air is high, complaints may be high even after short exposures, because the glycol concentration required to approach saturation increases sharply with temperature. The indications are that glycolization in warm weather is undesirable and impractical unless the temperature is reduced by refrigeration.

Another practical drawback to the use of the triethylene glycol is its low volatility and the small range between bactericidal and fogging concentrations. These introduce difficulties in securing even distribution and control of glycol concentrations in all parts of a room without inducing condensation. The use of room fans facilitates distribution

but may cause uncomfortable drafts. Opening windows and doors seriously aggravates the distribution problem.' An automatic controlling device described by Puck, Wise, and Robertson<sup>37</sup> helps but does not entirely solve the problem.

Owing to excessive condensation of the vapor inside the ducts, distribution of glycol vapor through conventional duct ventilating or 'air conditioning systems' is also troublesome, particularly in warm weather.

In vaporizing glycol for air disinfection, it is important to keep in mind that glycols disintegrate at boiling temperatures under normal atmospheric pressure to produce acrolein which is extremely irritating to the throat and lungs. The disintegration temperature of triethylene glycol is placed at 260° F.<sup>38</sup>

#### DISCUSSION AND RECOMMENDATIONS

It appears from the foregoing review that a first step in the disinfection of air in barracks, wards, and similar places of assembly in military establishments is suppression and removal of dust and lint particles. The oiling of floors and blankets and, in hospital wards, of sheets and pillow cases, has been shown to be a practical, cheap, and effective measure. It reduces the bacterial content of the air, and there is evidence that it may in some degree reduce the risk of transmission of certain bacterial infections, particularly those due to hemolytic streptococci, Group A. A reduction in the risk from virus infections has not been demonstrated, although some experimental work with influenza virus suggests this possibility. On the basis of present studies, both the Army and the Navy have accepted the oiling or related treatment of floors for dust control and the oiling of bed clothing under appropriate circumstances as recommended sanitary practice.

Experimentally it has been established that, under ideal laboratory con-

ditions, bacteria and viruses suspended in the air as finely dispersed particles can be rapidly inactivated by exposure to adequate concentrations of triethylene glycol vapor. In the glycolization of the air of barracks, hospital wards, and similar places of assembly, under actual conditions of use and occupancy, however, there were a number of factors that limited its effectiveness. It has been shown that under the most favorable circumstances, triethylene glycol vapor will reduce the total number of bacteria (or the number of bacteria of a pathogenic species, such as the hemolytic streptococci, Group A) in the air by as much as 90 per cent. However, this is not a measure of effectiveness in reducing the spread of respiratory infections. Under natural conditions dispersed aggregates of bacteria and viruses carried by air currents represent only one of the channels by which infection travels from person to person. Others exist, too. Infective particles may pass directly from one individual to another in face-to-face contact. The heavier infective particles, including lint from contaminated blankets, bedding, clothing, and handkerchiefs, may accumulate in dust in the immediate environment of an infected individual and will then constitute an important channel for short range transmission of infection. The possibility of indirect transmission of infection by the handling of contaminated objects cannot be ignored. Undoubtedly the relative importance of these channels varies with the ability of different pathogenic agents to survive in the external environment and with the conditions of occupancy, the extent of crowding, and the kind of activity carried on. Examples are, hospital wards in which patients are confined to their beds or in which patients are ambulatory, classrooms, moving-picture theaters, dispensaries, and drill halls.

Up to the present, studies of the value of ultra-violet light and of triethylene glycol vapor in reducing the incidence of respiratory infections have been largely confined to barracks and hospital wards. The data available suggest that under some circumstances these both may have a measurable effect upon the attack rate from certain respiratory diseases, but experience is not sufficient to justify drawing definite conclusions.

The two primary conditions for the successful application of ultra-violet light to the disinfection of air are: (a) supplementing irradiation with dust suppression measures, since ultra-violet light is not efficient against bacteria and virus protected by dust; and (b) attaining a radiation of sufficient intensity but not so high as to affect the eyes or skin of occupants.

The use of triethylene glycol, too, must be supplemented with dust control measures if it is to be successful. The glycol concentration should be just below the saturation level with low rather than high temperatures. The glycol must be pure, made especially for air disinfection, and the vaporizing device must operate at relatively low temperatures. Glycolization of air at high temperatures is undesirable and impractical.

Admittedly, both ultra-violet light and glycols have their merits and demerits. Present knowledge is too limited to make any definite claims or predictions concerning their ability to reduce air-borne infection. The design and operation of apparatus for air disinfection is still on an empirical basis and the use of these disinfecting agents is not without danger (to the user). Extravagant claims for promotion of sales of disinfecting apparatus at this time may well retard progress and injure the industry.

The committee does not recommend the general use of these disinfecting devices for the present. Much research

and development work by qualified personnel remains to be done.

#### REFERENCES

1. Andrewes, C. H., *et al.* Control of Air-borne Infection in Air-raid Shelters and Elsewhere. *Lancet*, 2:770 (Dec. 21), 1940.
2. van den Ende, M., and Andrewes, C. H. Recent Experiments in England with Special Reference to the Importance of Dust. *Acrobiology*, Amer. Assn. Advanc. Sci. Washington, D. C., 1942, p. 281.
3. Robertson, O. H., *et al.* A Study of the Nature and Control of Air-borne Infections in Army Camps. *J.A.M.A.*, 126:993 (Dec. 16), 1944.
4. van den Ende, M., Lush, D., and Edward, D. G. F. Reduction of Dust Borne Bacteria by Treating Floors. *Lancet*, 2:133, 1940.
5. Krueger, A. P., *et al.* Laboratory and Field Studies of Glycols and Floor-oiling in the Control of Air-borne Bacteria. *U. S. Nav. M. Bull.*, 42:1288 (June), 1944.
6. Report of the Commission on Air-borne Infection to the Board for the Investigation of Epidemic Diseases. U. S. Army, April 26, 1945.
7. Commission on Acute Respiratory Diseases and Commission on Air-borne Infections: A Study of the Effects of Oiled Floors and Bedding on the Incidence of Respiratory Diseases in New Recruits. *Am. J. Hyg.*, 43:120 (Mar.), 1944.
8. Loosli, C. G., and Robertson, O. H. Recent Studies of the Control of Dust-borne Bacteria by Treatment of Floors and Bedclothes with Oil. *Am. J. M. Sc.*, 209:166 (Feb.), 1945.
9. Loosli, C. G., *et al.* The Oil Treatment of Bedclothes for the Control of Dust-borne Infections, II. *Am. J. Hyg.*, 43:105 (Mar.), 1946.
10. Wright, J., Cruickshank, R., and Gunn, W. The Control of Dust-borne Streptococcal Infection in Measles Wards. *Brit. M. J.*, 1:611 (May 6), 1944.
11. Anderson, P. H. R., Buchanan, J. A., and MacPortland, J. J. Oiled Floors to Control Respiratory Infection. *Brit. M. J.*, 1:616 (May 6), 1944.
12. Feasby, W. R., and Bynoe, E. T. Survey of Hemolytic Streptococcus Infections at Camp Borden, Ontario. I. Epidemiology. *War Med.*, 5:207 (Apr.), 1944.
13. Wells, W. R., and Fair, G. F. Viability of *B. coli* Exposed to Ultraviolet Radiation in Air. *Science*, 82:280 (Sept. 20), 1935.
14. Hollaender, A., *et al.* Control of Air-borne Microorganisms by Ultra-violet Floor Irradiation. *Science*, 99:130 (Feb. 11), 1944.
15. Wells, W. F. Bactericidal Irradiation of Air. *J. Franklin Inst.*, 229:347 (Mar.), 1940.
16. Buttolph, L. J. Physical Basis of Air Disinfection by Ultra-violet Energy. *Arch. Phys. Therapy*, 25:671 (Nov.), 1944.
17. Rentschler, H. C., and Nagy, R. Bactericidal Action of Ultra-violet Radiation on Air-borne Organisms. *J. Bact.*, 44:85 (July), 1942.
18. Wheeler, S. M., Jr., *et al.* Ultra-violet Light Control of Air-borne Infections in a Naval Training Center. *A.J.P.H.*, 35:457 (May), 1945.
19. Schneider, R., *et al.* Effectiveness of Ultra-violet Irradiation of Upper Air for the Control of Bacterial Air Contamination in Sleeping Quarters. Preliminary Report. *Am. J. Hyg.*, 40:136 (Sept.), 1944.
20. Lurie, M. B. The Prevention of Natural Air-borne Contagion of Tuberculosis in Rabbits by Ultra-violet Irradiation. *J. Exper. Med.*, 79:559 (June), 1944.
21. Bu. Med. Research Project X-231. Ultra-violet Light Control of Air-borne Infections in a Naval Training Center. 1944-1945. Unpublished.



22. Bu. Med. Research Project X-474. Control of Air-borne Infections in the Naval Barracks by Combined Ultra-violet Radiation and Dust Control. 144-45. Unpublished.

23. Council on Physical Therapy: Acceptance of Ultra-violet Lamps for Disinfecting Purposes. *J.A.M.A.*, 122:503 (June 19), 1943.

24. Coblenz, W. W. Ultra-violet Lamps for Disinfecting Purposes. Present Status. *J.A.M.A.*, 129:1166 (Dec. 22), 1945.

25. Masterman, A. T. Air Purification in Inhabited Rooms by Spraying or Atomizing Hypochlorites. *J. Indus. Hyg.*, 20:278 (Apr.), 1938.

26. Robertson, O. H., Bigg, E., Miller, B. F., and Baker, Z. Sterilization of Air by Certain Glycols Employed as Aerosols. *Science*, 93:213 (Feb. 28), 1941.

27. Robertson, O. H., Bigg, E., Puck, T. T., and Miller, B. The Bactericidal Action of Propylene Glycol Vapor on Microorganisms Suspended in Air. *J. Exper. Med.*, 75:593 (June), 1942.

28. Robertson, O. H., Puck, T. T., Lemon, H. F., and Loosli, C. G. The Lethal Effect of Triethylene Glycol Vapor on Air-borne Bacteria and Influenza Virus. *Science*, 97:142 (Feb. 5), 1943.

29. Hamburger, M., Jr., Puck, T. T., and Robertson, O. H. The Effect of Triethylene Glycol Vapor on Air-borne Beta Hemolytic Streptococci in Hospital Wards. *J. Infect. Dis.*, 76:208 (May-June), 1945.

30. Puck, T. T., Hamburger, M., Jr., Robertson, O. H., and Hurst, V. The Combined Action of Glycol Vapor and Dust Control Measures. *Ibid.*, II, p. 216.

31. Harris, T. N., and Stokes, J., Jr. Summary of a 3-Year Study of the Clinical Applications of the Disinfection of Air by Glycol Vapors. *Am. J. M. Sc.*, 209:152 (Feb.), 1945.

32. Bigg, E., Jennings, B. H., and Olsen, F. C. W. Epidemiologic Observations on the Use of Glycol Vapors for Air Sterilization. *A.J.P.H.*, 35:788 (Aug.), 1945.

33. Report of the Commission on Air-borne Infections to the Board for the Investigation of Epidemic Diseases. U. S. Army, April 26, 1945.

34. Mather, J. M., and McClure, A. D. Experiences with the Use of Propylene Glycol as a Bactericidal Aerosol in an R.C.A.F. Barracks. *Canad. Pub. Health J.*, 36:181 (May), 1945.

35. Robertson, O. H. Sterilization of Air with Glycol Vapors. *The Harvey Lectures*, 38:227, 1942-1943. Williams and Wilkins Co., Baltimore, 1943.

36. Schwenker, F. F., et al. Study of the Use of Propylene Glycol Vapor for the Sterilization of Air to Combat Aerial Transmission of Communicable Diseases. Unpublished Bu. Med. Research Project.

37. Puck, T. T., Wise, H., and Robertson, O. H. A Device for Automatically Controlling the Concentration of Glycol Vapors in the Air. *J. Exper. Med.*, 80:377 (Nov.), 1944.

38. Hamburger, M., Jr., Robertson, O. H., and Puck, T. T. The Present Status of Glycol Vapors in Air Sterilization. *Am. J. M. Sc.*, 209:162 (Feb.), 1945.

ACKNOWLEDGMENTS: Appreciation is expressed to the Surgeons General of the Army, Navy, and the U. S. Public Health Service for their cooperation in the preparation of this report.

*Committee on Sanitary Engineering,  
National Research Council, Division of Medical Sciences*

ABEL WOLMAN, *Chairman*

G. M. FAIR

W. A. HARDENBERGH

R. E. LAWRENCE

K. F. MAXCY

W. D. TIEDEMAN

H. A. WHITTAKER

C. P. YAGLOU, *Consultant*

# Criteria for the Allocation of Subsidy to Local Health Departments\*

JOHN A. KAHL, M.D., M.P.H.

*Assistant State Director of Health in charge of Local Health Services,  
State Department of Health, Seattle, Wash.*

THE subject that I am to discuss today is perhaps one that is more controversial than any problem in the field of public health. One can bring together almost any group of state public health administrators and attempt to discuss a plan for the allocation of state and federal funds to local health departments, and have as many opinions of how it should be done as there are participants.

Recognizing this situation, I certainly do not propose that I can bring a final answer to health officers, but I shall attempt to outline some of the fundamental considerations which we believe in the State of Washington do assist us in doing a better job of administration for our local health departments.

First, I would like to say that we will never develop a single satisfactory, detailed plan that can be applied to every state in this nation. Furthermore, I would like to emphasize that no plan can be followed to the letter in each and every community in a state. But there are certain basic principles which make a plan of valuable assistance.

The desirability of a plan is known to all of you.

1. It provides the state administrator with a basis for an orderly and equal division of state and federal funds to local health departments,

thus avoiding dependence on opinion and impression.

2. It gives assurance to the state legislators and to the state administration that the funds available are being distributed to the communities of the state on a fair basis.

3. It provides the local health administrator with some assurance and understanding of what financial assistance he can expect from the state.

4. A plan, properly developed, will stimulate local health administrators and other local officials to increase local contributions if they know financial assistance will be forthcoming from the state.

5. If the plan is applied only to full-time health departments, as it should be, it will stimulate their development, and will further assist in developing them in accordance with the state overall plan for complete coverage by full-time health services.

Assuming that we have suitable legislation for the development of local county, city, and district health departments on a full-time basis, then the plan should embody certain principles:

1. It must recognize that all units of local government do not have the same financial ability to provide the necessary government services, including public health. Therefore there must be a method of equalizing these financial differences so that all counties can provide at least minimum health services.

2. It must stimulate local financial participation.

3. It must provide for financial participation by the state in each local health unit if a basis for state guidance is to be successfully developed.

4. It must take into consideration the various special problems and needs of the various individual communities.

\* Presented before the Health Officers Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 13, 1946.

within their financial ability we have developed the next step of the plan.

First we set aside a small amount of money for special needs, which will be discussed later. This in the past has amounted to approximately \$60,000 per year. With the remaining amount of state money we determine through trial, using as the basis the assessed valuation for each county or district, the maximum per capita amount in which we can participate on a matching basis. This at present is \$.75.

We have devised a guide for matching on the basis of assessed valuation per capita, since this is the only method upon which the county can raise additional revenue in our state. The guide is as follows:

1. The county with an assessed valuation up to and including \$500 per capita earns \$2 of state money for each \$1 of local money raised above the mandatory levy;
2. For each county with an assessed valuation from \$500 to \$1,000 per capita it earns \$1 of state money for each \$1 of local money raised above the mandatory levy;
3. For each county with an assessed valuation of \$1,000 or over per capita it earns \$1 of state money for each \$2 of local money raised above the mandatory levy.

We arrived at this plan by determining the assessed valuation per capita for all of our 39 counties and then grouping them into thirds. We found that the average per capita assessed valuation was \$880 and that the lower third was \$500 or less, and the upper third was \$1,000 or more.

We have determined as previously stated that we can match up to \$.75 per capita with the money available at present. However, we place two limitations upon granting the full amount earned.

1. If the county or district does not raise sufficient local money to match state money to reach the \$.75 per capita, we only grant the amount that they can match. But we may if indicated give a temporary grant for special needs.

2. We reserve the right not to grant the

entire amount earned if we know the county cannot or will not wisely utilize this money.

Reference to column 4 will show the amount of money per capita needed to bring the unit to \$.75 per individual. In column 5 is given the ratio of matching determined by using the assessed valuation per capita found in column 13, and applying it to the matching guide described.

In column 6 is given the amount of local money needed for matching and the amount of state money needed for matching will be found in column 7. Column 8 shows the amount of state money actually granted.

If the county's minimum mandatory levy exceeds \$.75 per capita, we do not grant any funds on a matching basis. However, as additional money does become available, we hope to match to \$1 per capita, or more.

In column 11 you will see that this procedure has been instrumental in increasing local funds far in excess of the minimum mandatory levy.

In order to make the plan flexible, we provide grants for special needs mentioned previously, and in our state these are:

1. Counties with a rapid increase in population resulting from war or industrial developments.

2. Counties containing large areas of federal land. As you know, these lands are tax-free, yet the county has the responsibility for providing health and police protection, as well as roads. We, therefore, attempt to compensate these counties for loss of revenue.

3. In the development of new health departments in order to demonstrate the value of good full-time health services, and thereby gain more active local support, including financial participation.

4. Demonstration purposes, principally to develop new and expand old programs and sell them to the local community.

In column 9 are presented the grants for special needs to the counties and districts. We like to think of special grants in most instances as temporary

assistance; however, in a few areas they will be continuous.

It will be noted that we are putting some state money into each full-time county or district health department; in some instances it is very small, but we feel it is sound administration (see column 10).

In summary I shall outline a few principles for the allocation of state subsidy to local health departments. Such principles, I feel reasonably sure, can be applied in any state. These should include:

1. A minimum mandatory financial requirement for each unit in the development and maintenance of its full-time public health department. This can either be a requirement by the state department of health before it will participate financially, or it can be, as in our state, a legal requirement.

2. There should be an equalizing factor because of financial variations and ability of counties to pay for public health service. This assistance may be based upon per capita income, expendable wealth per capita, or assessed valuation per capita. It will depend principally upon which method is the most practical for each individual state.

3. The plan should be so devised as to stimulate local government to increase financial support to a desirable maximum in the development and maintenance of its full-time health services.

4. The plan must be sufficiently well defined and publicized so that local health administrators and local officials will know what they can expect from the state in the way of financial assistance, on a long range basis.

5. The state should participate financially in every full-time health department in order to be in a position to exert some degree of guidance in the development of sound public health programs.

6. The plan should encourage the development of new and the expansion of old programs through some method such as special grants or grants for demonstration purposes.

Finally I would like to point out that this formula has been in operation in the state of Washington since 1940, and during this period it has had some rather rough going because of situations during the war period. It is, however, well accepted by the health officers in

the state and certainly it has been invaluable to me as the Director of Local Health Services during most of this period.

#### ANALYSIS OF EACH COUNTY AND DISTRICT

1. *Benton-Franklin Health District*—Special grant of \$4,376.00 was given because of rapid growth of population. In this area is located the atom's bomb plant at Richland.

4. *Cowlitz-Wahkiakum Health District* — Column 14 shows a special grant of \$8,014. Much of this was given on the basis of developing a satisfactory tuberculosis survey program. However, a small amount of this was given to assist the health department in giving increased services to the two major cities, one of 7,000 and the other of 12,000 in order to get them to participate.

5. *King County Health Department*—A special grant of \$5,680 was given on the basis of putting some state funds in each local department.

6. *Kitsap County-City Health Department* —The population of this county before the war was about 35,000 and did reach a figure of about 125,000. The population is rapidly decreasing and until some local census survey is made we will be unable to determine accurately what the population is; however, it is generally guessed that perhaps it is in the neighborhood of 70,000 at present, although we show 108,000. This accounts for the minus figure of \$18,315. This population will probably recede to about 50,000. In addition during the war the American Red Cross supplied approximately \$10,000 per year to this district for nursing service.

7. *Kittitas County Health Department*—In column 14 there is a grant of \$1,574. Approximately one-third of this county is national forest land. We will undoubtedly need to continue and increase the special grant to this county. However, it is hoped that at some future date we may combine it with Yakima County.

8. *Lewis-Pacific Health District*—This area has been without a full-time health officer for the last 2½ years. For that reason they are not in a position to use their full grant. However, they want a full-time health officer as soon as they can obtain one, and we will increase our grant.

9. *Mason-Thurston Health District* — A special grant of \$1,278 has been given because Mason County is about one-third national forest land.

10. *Clallam-Jefferson Health District*—This area has a special grant of \$6,177 on the

basis that approximately half of this area in each county is in the Olympic National Park.

11. *Okanogan County Health Department*—A very large county composed of three valleys, requiring long trips. Two-thirds of this county is national forest service land. Therefore, a grant of \$1,770 was given. The county is so large that it cannot be successfully combined with another county; although the population is small we will probably have to increase special aid to this county.

12. *Pierce County Health Department*—A special grant of \$7,593, principally for the development of a satisfactory maternal and child health demonstration.

13. *Snohomish County Health Department*—A special grant of \$6,070 to provide some services and demonstrate effectiveness of public health to the first class city, Everett, with a population of about 35,000, which is now a part-time unit, in order to get a combined unit eventually.

14. *Spokane County Health Department*—The grant was \$2,040 on the basis of putting some state money in each local unit.

15. *Walla Walla County-City Health Department*—A grant of \$7,948 on the basis of a large Veterans' Hospital for tuberculosis, an Army General Hospital of some 5,000 beds, which is now closed, and a large bomber training base. This grant will decrease.

16. *Yakima County-City Health Department*—The first class city in this district contributes large financial support and the health department has not sufficiently developed to a place where it can wisely utilize the additional money, so we have not granted them approximately \$26,000 they earn. Eventually they will obtain this money when they can wisely utilize it.

17 and 18. *Whatcom County-City Health District* and *Grays Harbor County* are both new districts and have not developed to a point where they can utilize additional money. This is due to personnel shortages.

---

## 1946 a Record Health Year in New York City

On New Year's Day, 1947, Health Commissioner Israel Weinstein, M.D., released a summary report of the work of the New York City Department of Health in 1946. He found many evidences of a healthy community. More babies were born than in any previous year in the city's history and the birth rate was higher than in any year since 1927. Both the infant and maternal mortality rates were the lowest on record. The general death rate was 10.1 per 1,000 population, a record bettered only in 1941 when the rate was 9.9 and in 1938 and 1942 when it was 10.1. The tuberculosis, pneumonia, and appendicitis death rates were the lowest on record; accidental deaths were lower only in 1944. There was an increase in reported cases of infectious venereal diseases.

Among the communicable diseases of childhood, whooping cough and scarlet fever deaths each decreased, the latter

almost to the vanishing point. The 18 diphtheria deaths were the largest number since 1939. The measles death rate was equal to that of 1943 and 1944 but higher than 1945.

Diabetes deaths decreased slightly both in number and rate; cancer deaths and the death rate were practically stationary. Approximately half of the nearly 78,500 deaths were of persons over 60 years of age.

Among the special events of the year were the outbreak and discovery of "Rickettsialpox" spread by mice, a continued increase in the number of chest x-rays, more than 12 times the number of persons x-rayed in 1944, an intensive city-wide program of restaurant sanitation, a ragweed destruction program through which 3,000 acres of growing ragweed were destroyed, and the completion of the micro-filming of all birth, death, and stillbirth certificates for the years 1847 to 1945.

# A Darkfield Colony Illuminator

RONALD M. WOOD

*Department of Bacteriology, School of Medicine, Johns Hopkins University, Baltimore, Md.*

THE illuminator herein described gives a transverse light across the Petri dish and illuminates the individual colonies by the darkfield principle.

Light is conducted to the rim of the Petri dish by an acrylic resin or similar material having the same optical properties (e.g., plexiglass, lucite, polystyrene, etc.): In this model the plastic is  $9/64$ – $5/32$  inch in thickness and has a circular opening  $3\frac{3}{4}$  inches in diameter to accommodate the lower section of the Petri dish. The edges (b, Figure 1) are bent to pick up the light from an ordinary light bulb. The plastic is covered with a piece of metal (a) (one side being cut away for purpose of illustration) having an opening of the same size. A piece of metal (c), painted black, serves as a support on which the Petri dish rests. The as-

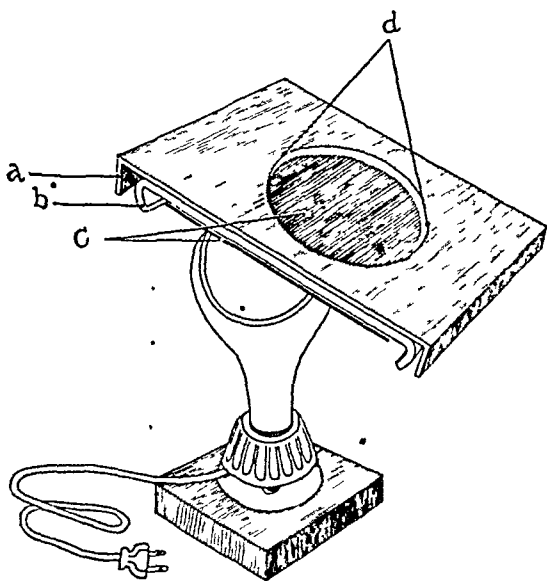


FIGURE 1—Darkfield colony illuminator

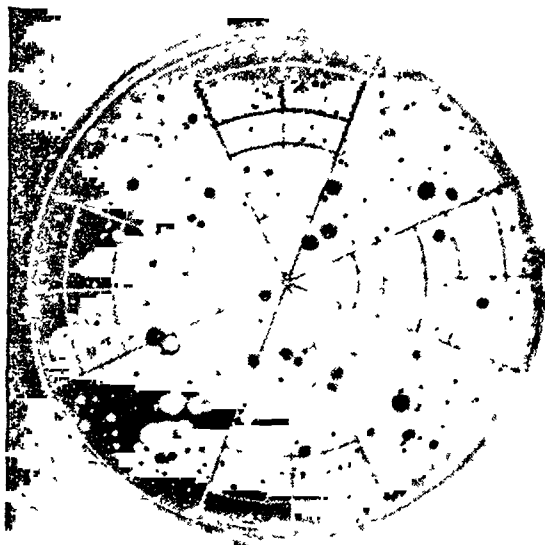


FIGURE 2—Colonies as seen over a Brown counting chart in the illuminator

sembly is arranged in conjunction with the light source so that it can be adjusted to any convenient angle. In use, the Petri dish is placed in the opening (d). All sizes of colonies stand out brightly against the black background. With this illuminator pinpoint colonies are easily distinguished from small particles in the medium. A magnifying lens may be used if desired. The model illustrated in Figure 1 is in actual use but is capable of further mechanical refinement.

This illuminator\* can be used with colony counting charts such as described by J. Howard Brown (Figure 2) on page 206. It is of simpler and less expensive construction than other illuminators on the market.

\* Available from Baltimore Biological Laboratory, Inc.

# Charts for Counting Bacterial Colonies

J. HOWARD BROWN, PH.D.

*Department of Bacteriology, School of Medicine, The Johns Hopkins University, Baltimore, Md.*

THE charts illustrated are of the diameter of the bottom of a Petri dish and are used for counting bacterial colonies in agar plates. The colonies may be counted by daylight, by the light of a desk lamp, or by means of an illuminator such as described by Ronald M. Wood.<sup>1</sup> The last gives the best illumination. If daylight or a desk lamp is to be used, a chart is placed into the lid of a Petri dish and the agar plate to be counted is placed, bottom down and without lid, into the lid containing the chart. It may be held securely in place by a rubber wedge. With the light falling on to the plate obliquely from above, the colonies appear white against the black background. A suitable magnifying glass may be useful.

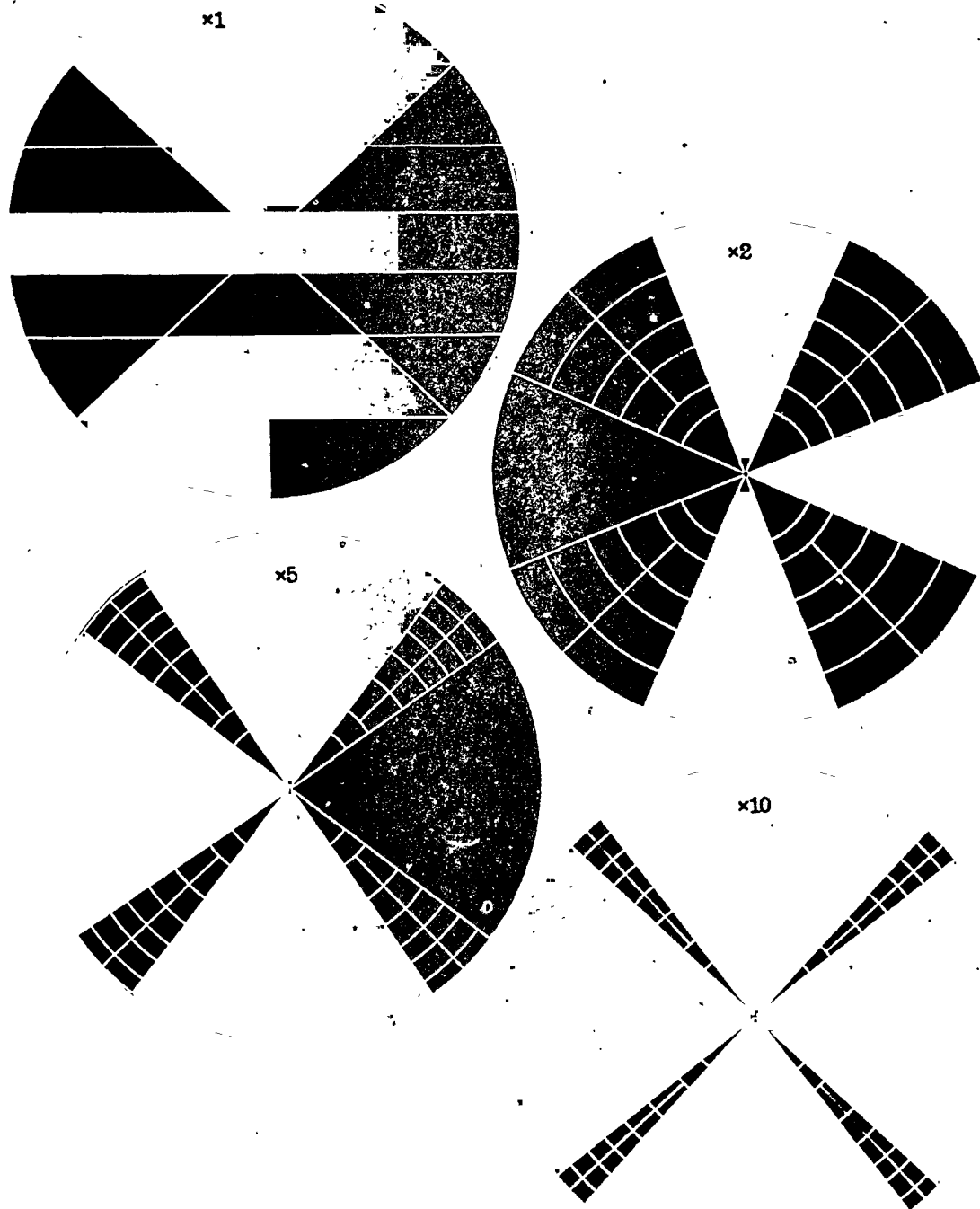
Four charts are illustrated. The  $\times 1$  chart is to be used when all colonies in the plate are to be counted. Chart  $\times 2$  is to be used when  $\frac{1}{2}$  of the colonies are to be counted, chart  $\times 5$  when  $\frac{1}{5}$ , and chart  $\times 10$  when  $\frac{1}{10}$  are to be counted. Charts  $\times 2$ ,  $\times 5$ , and  $\times 10$  are ruled radially so that the areas in two pairs of opposite sectors represent  $\frac{1}{2}$ ,  $\frac{1}{5}$  and  $\frac{1}{10}$ , respectively, of the area of the plate. All of the colonies in the four sectors should be counted and the result multiplied by the indicated factor. The counting of four sectors at right angles to each other helps to compensate for uneven distribution of colonies in the plate. Since the length of every arc of a sector is in similar ratio to the circumference at that point, all areas from the center to the periphery of the plate are given

proportionate evaluation, which is not true when a guide plate ruled in squares is used and consecutive squares are counted vertically and horizontally. Variations in the diameters of dishes do not enter into consideration.<sup>2</sup> It is obvious that these advantages do not exist in counting plates ruled in squares; hence the radial ruling results in greater accuracy and simplicity of calculation. Radial ruling was also employed in the Jeffers<sup>3</sup> plate but the subdivisions on this plate make calculation rather complicated. The subdivisions within the sectors of the charts here described and within the lines on the  $\times 1$  chart are purposely no calculated part of the sector or plate, the lines serving merely as guides to the eye. It is, therefore, impossible to slight the work of counting the colonies in an entire sector or the entire plate as the case may be. The practice should be to employ such a chart that no fewer than 100 colonies will be found in the four sectors to be counted. If there are fewer than 100 colonies in the plate all should be counted.

Similarly ruled charts have been tried for counting colonies against a white background illuminated by transmitted light, but we have obtained better results by counting against the dark background with reflected or darkfield illumination and there is less eye strain. The charts\* are inexpensive and may be discarded when soiled or worn.

\* Available from Baltimore Biological Laboratory, Inc.

## COLONY COUNTING CHARTS



## REFERENCES

1. Wood, Ronald M. A Darkfield Colony Illuminator. *A.J.P.H.*, 37, 2:205, 1947.
2. American Public Health Association. *Standard*

*Methods for the Examination of Dairy Products*, 8th ed., 1941, p. 35.

3. Jeffers, H. W. An Apparatus to Facilitate the Counting of Colonies of Bacteria in Circular Plates *J. Applied Microscopy*, I, 3:53 (Mar.), 1898.



# American Journal of Public Health

## and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 37

February, 1947

Number 2

### Editorial Board

REGINALD M. ATWATER, M.D.  
*Chairman, and Managing Editor*

IRA V. HISCOCK, Sc.D.  
KENNETH F. MAXCY, M.D.

RALPH S. MUCKENFUSS, M.D.  
ALTON S. POPE, M.D.

C.-E. A. WINSLOW, Dr.P.H.

C.-E. A. WINSLOW, Dr.P.H., *Editor*

AUGUSTA JAY, *Editorial Associate*

## THE STORY OF BRUCELLOSIS

WE are fortunate in presenting—as the Special Review Article for this issue—an address read by Dr. Alice C. Evans at the First International Congress for Brucellosis last fall.

Dr. Evans tells us that contagious abortion in cattle is at least a century old in the United States, having been described in New York State as early as 1843. The first human case of undulant fever was reported by Craig in 1906, but believed by him to be a tropical disease caused by contact with a hospital patient. In 1911, Malta fever was described in Texas and the local name of "goat fever" was cited. In 1914, came the first description of contagious abortion in swine.

Dr. Evans and Dr. Eichhorn in a laboratory "bull-session" pooled the viewpoints of bacteriology and pathology and hit on the idea that the three diseases (Malta fever of goats, and contagious abortion of cattle and swine) might be closely related. By 1918, Dr. Evans proved that *Bacillus melitensis* and *Bacillus* (later *Brucella*) *abortus* were indeed identical organisms; or—at most—closely related variants of the same species. In 1924, Keefer described a human case of undulant fever in an employee of a slaughterhouse, the first case of this human disease traced to any animal source other than the goat, which had long been recognized as a host of "Malta fever." By 1927, 217 human cases of what had then come to be known as brucellosis were reported and by 1938 the number had risen to 4,000 cases a year, a figure which has remained fairly constant since that time. This is the disease once called undulant fever in man (a name which should now be abandoned); and caused by any of the three types of *Brucella abortus* causing Malta fever in goats and contagious abortion in cattle and swine.

Whether the importance of this disease was merely unrecognized prior to 1927, or whether the bovine and porcine strains have acquired greater virulence in recent years, no one can say. That the disease is now of considerable public health importance seems clear. Dr. Evans herself suffered a long and tedious attack of chronic brucellosis (caused by a laboratory infection) and she speaks with feeling of its effects and of the anxiety due to extended delay in clinical diagnosis. A number of recent studies show that the actual number of cases of chronic brucellosis is at least ten times the number of reported cases, approximately some 40,000 cases a year in the United States. A much higher estimate (4,000,000!) cases is

given by Huddleson but one cannot take very seriously an extrapolation based on incidence in one particular institution.

The problem, however, is a very real one—both for public health officers and for veterinarians; and Dr. Evans's story of its progressive solution is as dramatic as a "mystery story."

DISEASES OF AN AGING POPULATION

A RECENT issue of the *Statistical Bulletin* of the Metropolitan Life Insurance Company<sup>1</sup> contains figures which are, in some respects surprising, and in all respects encouraging. These computations of mortality among industrial policy holders in 1911 and 1945, respectively, show that in one-third of a century the mortality in this large group from major causes, standardized for color, age, and sex had changed as follows:

Cause of Mortality	Deaths per 100,000		
	1911	1945	Per cent Change
Diseases of Heart, Arteries and Kidneys, combined	330	233	—29
Tuberculosis	242	33	—86
Influenza and Pneumonia	141	22	—84
Accidents	87	56	—36
Cancer	76	82	+ 8

It has been commonly recognized that the crude death rates from diseases of the heart, arteries and kidneys, and from cancer have increased solely on account of the changing age distribution of the population. Many of us have not realized that the same thing is true of deaths due to accidents, which are so much more often fatal for those enfeebled by old age. It appears from these standardized rates that mortality for a really comparable population has decreased by some four-fifths for tuberculosis and pneumonia and by about one-third for diseases of the cardio-arterial-renal complex and for accidents (the latter in spite of the development of motor traffic). Cancer remains practically unchanged, the slight increase recorded being rather less than might be expected from improvements in diagnosis.

Yet, in spite of these heartening figures with respect to adjusted death rates—the brute fact remains that actually, today, one person in 400 dies each year from diseases of the cardio-arterial-renal complex and one person in 1,200 dies each year from cancer. These are the outstanding causes of mortality. These are the major public health problems of the future. Therefore the articles in this issue of the JOURNAL on the diseases of an aging population are timely and important.

REFERENCE

1. *Stat. Bull.*, 27:11 (Nov.), 1946.

FULL-TIME HEALTH SERVICE IN ILLINOIS

WE were able last month to present to readers of this JOURNAL a supplement embodying the full proceedings of the conference on local health units held last fall at Ann Arbor. This conference sounded a bugle call for advance in our basic task of extending the advantages of expert health leadership to the entire

nation. Furthermore, we believe that the proceedings of this conference will prove a valuable textbook on public health practice for many years to come.

It is of interest to note how the movement for full-time health service has gone forward in one state—Illinois. In this state, a survey conducted by the field staff of the American Public Health Association in 1941–1942, resulted in a strong recommendation that an attempt be made to obtain legislation which would permit counties to establish and maintain full-time health departments. The survey staff suggested that a state-wide public health committee consisting of influential citizens throughout the state be appointed for the purpose of developing favorable sentiment for the proposed legislation. In accordance with this recommendation, the Illinois State-wide Public Health Committee came into being in 1942 and now consists of several thousand persons from all parts of the state.

The committee was successful in attaining its first objective in 1943. The resulting statute, known as the Searcy-Clabaugh County Health Department Law, was drawn up after consultation with the American Public Health Association, the Illinois State Medical Society, the Illinois State Dental Society, the Illinois Legislative Council, and other interested groups. This bill, while under consideration in the general assembly, had the support of many state-wide agencies and organizations such as the Illinois State Medical Society, the Illinois State Dental Society, the Illinois League of Women Voters, the Illinois Congress of Parents and Teachers, the Illinois Public Health Association, the Illinois Welfare Association, and others. Due in a large measure to the fact that this bill was supported by widespread public sentiment which had been aroused by the State-wide Public Health Committee, it was passed without a dissenting vote in both houses of the legislature and became a law in July, 1943. At this time there was in existence only one full-time county health department. This was the Cook County Health Department which had been established as a Bureau of the Cook County Department of Welfare in 1940.

After the enactment of this enabling legislation, the State-wide Public Health Committee, with the support of the Illinois Department of Public Health and various voluntary public health agencies, took as its next objective the development of local sentiment for the establishment and maintenance of county health departments. In November, 1944, the proposal to establish county health departments was considered in referenda in two counties. In both of these counties the outcome was favorable. In April, 1945, the proposal was considered by three counties, two of which voted to establish health departments. It was not until 1946, however, that public sentiment had been developed to the point that referenda could be held in a considerable number of counties. In November, 1946, the proposal was considered in 18 counties at the general election. In these counties the outcome was favorable in 17. In 10 of the 21 counties in Illinois which have voted favorably upon the county health department proposal, emergency health departments had existed during World War II. The influence of this experience and of the work done by the State-wide Public Health Committee through the activities of local committees in counties in which campaigns for health departments were waged in 1946 is evidenced by the fact that in 15 of the 18 counties, more than two-thirds of the persons voting on the proposal voted in favor of the establishment of health departments. In 7 of the counties, the proportion of favorable votes rose to 80 per cent.

The technique employed in Illinois should receive serious consideration by the health officials and the voluntary health organizations of other states. It is

often possible to secure the passage of any particular item of health legislation very easily by direct personal contact with a few influential members of the legislature. The establishment of local health units under a state enabling act, however, requires local as well as state action, and the maintenance of such units after they are established demands a wide basis of informed public support. John Simon in commenting on Edwin Chadwick's zealous—but not always judicious—efforts to promote the cause of public health a century ago says, "He could not advisedly have thought it possible to snatch his verdict and to revolutionize national habits by surprise," and adds that "He perhaps did not sufficiently recognize that the case was one in which deliberate national consents had to be obtained, and in which therefore no real, no permanent, success could be won, except in proportion as the people and their representative bodies should have made way in a necessarily gradual process of education."

The development of widely-based popular support such as that provided by the State-wide Public Health Committee of Illinois is no easy task; but it is, in the long run, the surest and safest road to the Promised Land.

## THE STAFF OF LIFE

AT the 73rd Annual Meeting of the Association, two years ago, the following resolution was unanimously adopted:

WHEREAS, the order of the War Food Administrator making compulsory the enrichment of white bread and rolls, the legislative action of certain states with regard to enrichment of certain staple foodstuffs, and the voluntary action of many food industries have resulted in an improvement in the national dietary with respect to several highly essential nutrient elements, and

WHEREAS, this enrichment in staple low cost foods has been of proportionately greater benefit to the economic groups whose diet is most in need of betterment, and

WHEREAS, the federal order for enrichment of white bread and rolls will terminate with the passing of the war emergency, be it

RESOLVED that the American Public Health Association goes on record as favoring appropriate state and federal action to perpetuate the benefits that have accrued to the national dietary through enrichment of staple foods in accordance with the recommendations of the National Research Council.

The contemplated emergency has arisen. The federal regulations which have proved so valuable are now no longer in existence; and it is of vital moment that state legislation should be enacted as promptly as possible to fill the vacuum. The need for action is particularly pressing in the case of flour.

The particular form which a state law should take must be determined by local conditions; and, in several instances, the state health commissioners of neighboring states have discussed the problem during the past few months. The problem can be best met either by adoption of the model act proposed by the Council of State Governments, or by an act requiring that flour and bread (or, perhaps, all foods) sold in the state must conform to the standards set by the Federal Food and Drug Administration for enriched flour (or other foods). In any case, a single standard of enrichment on a country-wide basis is essential.

We urge upon the state health departments of all our states that they give serious consideration to this question and submit appropriate bills for the consideration of their respective legislatures during the 1947 sessions.

# Credit Lines

## ADVERTISING METHODS IN RECRUITMENT

Among the papers presented on the program of the Merit System Unit at the 74th Annual Meeting in Cleveland in November was one by Richard Wm. Wallen, Ph.D., of Western Reserve's Personnel Research Institute. His title was "The Adaptation of Modern Advertising Methods to the Recruitment of Personnel." A summary of his paper, prepared for Credit Lines, follows:

Psychology, with its interest in the problems of human beings has much to contribute toward building up the kind of public health department public health people want. Sinking his voice to a murmur, Dr. Wallen mumbled, "The American Public Health Association is giving away diamonds at the end of the meeting." Everyone in the audience craned forward, unable to catch his words. Then he shouted the same sentence, citing the first performance as an example of our failure to reach people with our message. The American Public Health Association *has* diamonds—jobs in public health—to give away, but in offering positions of real opportunity and service, we are mumbling and failing to attract the finest quality of personnel.

He then asked the audience to list three pairs of A's standing for: Aiming Advertising, Attracting Attention, Appealing to the Applicant.

*Aiming Advertising*—A true fisherman determines the kind of fish he wants to catch, seeks out the places where they are, suits his rod, line, and bait to the fish's taste, and then angles with patience and skill. "Where are the skilled physicians and nurses you want to attract to your jobs?" It is necessary to aim advertising at the time and place where prospective staff members are. Quoting Dr. Wallen: "You don't use *Colliers* but the *Journal* of the American Public Health Association. What about schools and colleges, training centers, representing reservoirs of public health power? Are you at the level of people in training? Do not waste time on a shot-gun attack if a rifle will do better."

*Attracting Attention*—We need to make people turn their heads and look at the announcements in the recruitment program. The tone of general advertising must be watched.

It may be a chatty letter to a group of girls in training or a dignified letter to physicians, but all factors must operate within the framework. Nobody cares about a simple announcement of "positions open"—everyone is interested in his own life and the things he's going to get out of it. The heading must stand alone. Pictures are said to be worth a million words. Interesting pictures in public health work will make people read. Recruiting material must arouse emotional not purely academic interest. Color helps. The staid physician may not glance at something that looks like an advertising blurb, but an unusual color presents interest. "Try to follow the fish's thoughts as you dangle the hook!"

Out of sight is out of mind. An idea must be kept before the people you are trying to attract, and repeated. Out of thousands who go to college many would be good for public health work, but neither you nor they know it unless they have heard favorably of public health before they get training. An individual might want the chance six months from now that he spurns today; so you have to keep the chance there.

Timeliness is very important. As an example, Dr. Wallen recalled an effective sign near the ferries which go to New Jersey, and which commuters could see on their way home to Jersey at night. "If you lived in London Terrace, you would be home now!"

Appointments should be made into news items; tell about the people taking the jobs; make their communities proud of them. There are hundreds of human interest stories concealed in the files of the health departments the country over. They would make timely magazine articles—human interest material. "Articles in magazines help sensitize the public to the need for well trained people, and as Dr. Racker pointed out, get to your students."

*Appealing to the Applicant*—Appealing to the applicants is the heart of modern advertising. Do you want to go out with lassoes and butterfly nets to get people to take examinations, or do you want them to come to you as flies crawl over sugar. Provide the sugar.

There are four motives which activate most people and which may be described as the four S's. 1. Salary. In your field salary is not very high, so something else must be emphasized. 2. Status. People want prestige and recognition. They want a place

in the community, and professional opportunity for original and creative thought. They want something they can be proud of. 3. Security. People work for a shield against the years. If you can offer security as well as a job to be well done, you have a powerful appeal to people who are not sure whether their jobs in private industry will last. 4. Service. Perhaps this is a sentimental motive, but young people in training genuinely want to be of service. The poster notice of job opportunities doesn't show this. Make it live in sentences and phrases.

There is need for research in your field. You do not know what attracts people into public health work. You might learn through questionnaires. Find out also why people stay away. A study of the attitudes toward and information about public health of the people in training will tell you what they think and know about public health. I have heard of people who are members of the American Public Health Association and don't even know it.

Make it easy for applicants to respond to an appeal. The message should be short and memorable. Supply penny postcards on which interested people may write to you for more details. See that the hours when you can see applicants suit the hours when people can come. People who are working on another job can't get away between 9 and 4:30, so you need hours in the late afternoon or evening.

Letters should be written by electric typewriter and signed in ink to look genuine. A card saying, "I am interested in your announcements of . . . . . ." with ample space for name and address, should accompany the letter describing the position. After that it's a matter of selling.

Tell what health service does for people and how it can increase their satisfaction in living.

The problem is not complicated, but it requires work. I have tried to make this audience feel the problem emotionally in order to get action on it.

#### VERMONT STATE HEALTH COUNCIL

As late as July, 1946, there were no local health departments in charge of full-time medical officers in the entire State of Vermont, a situation in which this state was unique among the 48 states. That this is not to be a continuing condition is indicated by the formation of the Vermont State Health Council late in 1946. Made up of representatives of 29 organizations interested in health problems, the council was organized under the sponsorship of the Vermont State Medical Society. The Chairman of the Council is Frank C. Angell, M.D., of Randolph, and John W. Brownlee of Rutland, President and Executive Secretary, respectively, of the Vermont Medical Society. Among those serving on the Executive Committee is Robert B. Aiken, M.D., Acting Secretary and Executive Officer of the State Health Department.

The State Health Council is an outgrowth of Governor Proctor's Health Plan developed by a Health Advisory Committee appointed in 1945. By the middle of 1946 it had adopted a 22 point

health program, many principles of which are embodied in the Constitution of the newly formed Health Council.

Included in the governor's health plan is a recommendation for the organization of the state into five health districts to cover the entire state and the establishment of health centers in appropriate rural areas. The district staff would include, as a minimum, a full-time health officer, a secretary, and a staff of nurses. The districting of the state proposed in Dr. Haven Emerson's *Local Health Units for the Nation* is included in the governor's plan with only minor changes. The governor further points out that Dr. Emerson's recommendation that "all phases of health work be headed up in these districts . . . may be an answer to the proper organization in the state for the improvement of health." Among the purposes of the new council is "extending the physical facilities of health to the point where complete coverage becomes possible for all people in the state of whatever status wherever located."

Among other recommendations, in-

cluded also in the Council's Constitution, are coördination of health facilities in departments of health, welfare, and education; an adequate building for the State Health Department, the establishment of local health councils, a Division of Nutrition in the State Health Department, and adequate programs for the control of tuberculosis and of Bang's disease.

#### MISSISSIPPI BEGINS TO CUT ITS RURAL DOCTOR SHORTAGE

According to a special tabulation for the year 1941 made by the U. S. Public Health Service, Mississippi ranked lowest among the 48 states in the ratio of practising physicians to population. At that time there was in the state only one practising doctor for every 1,700 persons, whereas in the United States as a whole there was an average of one for approximately 800 persons.

These figures give point to a recent announcement by the Mississippi State Medical Education Board that 47 new doctors will come to Mississippi in the next 5 years. Charged with the administration of the program by the 1946 Legislature, the board has granted 47 scholarship loans effective for the first semester of 1946-1947. The students awarded the scholarships have signed contracts to practise in rural Mississippi upon completion of medical education and internship.

The 47 students are attending 11 different medical schools throughout the nation, 30 of them in Mississippi's two medical schools. They come from 28 towns in 23 counties of the state; more than half of them from towns of less than 4,000 population. They include 21 World War II veterans, 6 women, and 4 Negroes.

#### PHILADELPHIA VISITING NURSE ANNUAL REPORT

*That Little Black Bag* with its picture on the leaflet title page is the

spring board for the annual report of the Visiting Nurse Society of Philadelphia. A chatty story on what the bag contains and what services are rendered by the nurses who carry it, illustrated with line drawings in red, leads up to service statistics, financial statement, and important names. All in all an effective report that tells a lot with little expenditure of words or paper.

#### INFLUENZA VACCINE STUDIES IN ILLINOIS

Students at the University of Illinois, Northwestern University, and two state normal schools are being offered influenza vaccine on a voluntary basis. A comparison of the incidence of the disease in those who accept the vaccination and those who do not will be made to help in establishing the effectiveness of the vaccine. The Illinois State Department of Health is making the study possible by furnishing the vaccine without charge.

#### MINNESOTA STUDIES THE AGING PROCESS

Under an experiment conducted by Ancel B. Keys, Ph.D., the University of Minnesota's Laboratory of Physiological Hygiene will study the aging process. Half of the 400 voluntary "guinea pigs" will be university students between 18 and 20 years and the other half men between 45 and 60.

#### CURED CANCER CLUB

A new type of cancer education has been developed by the Queens County (New York) Cancer Committee of the American Cancer Society. Its first member, cured of cancer seven years ago, was selected in August, 1946. Membership is open to Queens persons who have been cured for five years or more. There is also provision for auxiliary membership for those cured for less than five years.

In addition to serving as an incentive

to make people realize that cancer is curable, it is also hoped to gain information on the number of persons in Queens who have been cured of the disease.

Coöperating with the Queens Committee is the New York City Department of Hospitals. Dr. Leonard Goldman, director of the department's free cancer detection and prevention clinic at Queens General Hospital, supervised the organization of the club.

#### MEDICAL CARE FOR FAMILIES OF YALE STUDENT VETERANS

Yale University now provides medical care for dependents of veterans enrolled as students in the university. Both clinical and home medical services are provided at nominal fees through a panel of physicians to which patients are referred by the university department of health. Clinic service is provided by the Grace-New Haven Community Hospital for standard clinic fees. Maternity cases are cared for at the Prenatal Clinic, hospitalization is provided by the Grace-New Haven Hospital.

#### PARENTS OF SPASTIC CHILDREN FORM ADVISORY COUNCIL

Late in 1946 a National Advisory Council composed solely of parents of spastic children was formed under the auspices of the National Society for Crippled Children and Adults. This Council will work at the Chicago Headquarters of the Society and through member groups in the 48 states. The parents will make recommendations for the location of clinics, nursery schools, training centers and rehabilitation centers for spastic children.

#### LITERATURE AVAILABLE ON MILK AND OTHER FOODS

The U. S. Public Health Service under date of October, 1946, has prepared a "List of Publications of Milk and Food Section." The items listed are

those available without charge from the Milk and Food Section, Sanitary Engineering Division, or the Publications Section, U. S. Public Health Service, and those for sale by the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

The list includes the "Milk Ordinance and Code," and similar codes and reports of the U. S. Public Health Service as well as reprints from *Public Health Reports* and from technical journals and popular magazines. Copies of the List may be obtained free of charge from the Milk Section, Sanitary Engineering Division, U. S. Public Health Service, Washington 25, D. C.

#### DISABLED VETERANS NOT VOCATIONALLY HANDICAPPED

Two news items about disabled veterans are passed on to our readers. First is the reënlistment by the Army of disabled veterans. The Army opened its ranks to this group on the plea of a 29 year old former Air Force master sergeant who lost his left forearm in Pacific combat. It is expected that about 5,000 disabled veterans will re-enlist. National Commander Griffith of the American Legion commended the War Department and suggested that other branches of the armed services follow suit.

The other news is of movies about the disabled veteran. The Office of Vocational Rehabilitation, Federal Security Agency, in December released "Come-back" for non-theatrical showing to employer groups throughout the country. It demonstrates that a disabled person, properly trained for work and placed in the proper job, is no longer vocationally handicapped. Among the scenes are the successful battle against disabilities waged by Jane Froman, Al Capp, Bill Stern, and Tami Mauriello, among others. The film was made with the coöperation of the Bulova Watch Company, Caterpillar Tractor Company,



Ford Motor Company, and Western Electric Company, all of which are successful employers of handicapped persons.

In releasing news of the film, Michael J. Shortley, Director of the Office of Vocational Rehabilitation said, "If the million still waiting for rehabilitation were to make approximately as good a showing as was actually achieved by the 36,000 who returned to jobs last year, their contribution to the wealth of the nation would approximate two billion dollars a year. In many cases the income tax paid by a rehabilitated worker in a single year would more than offset the entire cost of the services extended to him."

The American Legion is also showing its film, "No Help Wanted," a factual presentation of the employment capabilities of the disabled.

#### CANNING SAFEGUARDS AGAINST BOTULISM

The Bureau of Human Nutrition and Home Economics of the U. S. Department of Agriculture has completed a three year intensive laboratory research on home canning of low acid foods (meat and practically all vegetables). The amount of heat it takes to kill highly heat resistant organisms in low-acid vegetables and meats has been put to careful test. The results provide new evidence that steam pressure is the only way to can this class of foods in home kitchens. But it is now recommended that steam processing time can be from 25 to 50 per cent shorter than was earlier thought possible for vegetables in pint glass jars and for some in quart jars.

The results of the research have been published in U. S. Department of Agriculture *Technical Bulletin* No. 930 "Home Canning Processes for Low-Acid Foods Developed on the Basis of Heat Penetration and Inoculated Packs." This is available from the

Superintendent of Documents, Washington, D. C., at 10 cents a copy.

#### FLORIDA WANTS LOCAL HEALTH UNITS

The Credit Lines editor recently had occasion to look through the files of state health department bulletins. He found that *Florida Health Notes* has been engaged in a campaign of making Floridians "local health unit-conscious," and telling them of the state's unmet health needs.

The March issue, for example, points out the need for more adequate local health department buildings and equipment, and quotes the testimony of Dr. Atwater for the Association before the Senate Committee on Bill S 191 that less than 10 per cent of the health departments of the country are provided with physical facilities even approaching standards of adequacy.

The May issue describes a local health unit fully, tells how one is made possible by Florida law, and gives the procedure for organizing one. Each local health unit activity is described and illustrated with photographs from actual operating units.

August is devoted to Florida's Public Health Problems and what is needed to combat them. "The first and most essential need is the completion of an efficient organization covering the entire state—a full-time health department in every county." One by one the problems are outlined in words and pictures—malnutrition, hookworm, tuberculosis, and many others.

#### THE WISCONSIN CRUSADER IS NOW PICTORIAL

*The Crusader* of the Wisconsin Anti-Tuberculosis Association (Health Service Building, Milwaukee 2) went pictorial with the September, 1946, issue. Its editor, Harold Holand, sends Credit Lines the last four issues of 1946. He believes it to be "the first such publication to concentrate on photographic

rather than textual presentation." It has many ideas worth study by other editors of health education publications. It continues to be on good paper and attractively done in color, chiefly clear-cut red and black. One sour note to the editor: The foggy blue-Monday blue of the November issue "pleaseth us not."

#### ALMANAC FOR HEALTH EDUCATION

The almanac is the most thumbed book in the great farm regions of the Middle West. Building on this, Nina Lamkin, Director of Public Health Education in the Nebraska State Health Department, has prepared a 1947 Almanac "For Better Health in Nebraska." It has the paper and typography of the traditional almanac as well as historical notes on the days of the year, notes on the sun and the moon. But its limericks, its epigrams, pictures, questions and answers are all related to health. The sum total is a story of what services the State Health Department provides, why there should be local health departments, and what they can do for a community, and simple summaries of health matters—the Rh factor, chest x-rays, school health, and many others. It is an excellent piece of grass roots health education. The Almanac doesn't say so, but we assume the editor (State Capitol, Lincoln, Neb.) would be proud to share it with you.

#### TEACHER AIDS IN KEEPING CHILDREN WELL

In August (p. 903) we reported the Film Strip, "Teacher Observations of School Children." Since then the Metropolitan Life Insurance Company has issued a supplementary booklet "What Teachers See," containing many of the pictures (in excellent color) shown in the film and explaining more fully how to recognize a healthy appearance in children as well as signs indicating departures from it. The film and

its accompanying booklet are considered in the nature of an experiment, which, if successful may lead to preparation and distribution of similar visual aids for teachers and parents. The Film Strip is available for loan from the Metropolitan Life Insurance Company, 1 Madison Avenue, New York 10, N. Y., and is accompanied by the supplementary material.

#### TROUBLE AHEAD FOR ANTIVIVISECTIONISTS

Credit Lines has already noted the organization of the National Society for Medical Research (September, 1946, p. 1062). Our December mail shows that this is more than a paper organization. It sends us an information bulletin on happenings in the anti-vivisection world the country over—and even beyond. It also sends a financial and activity report made to the Association of American Medical Colleges under whose auspices it is organized. Other items include "What Value Animal Experimentation," by Harold C. O. Holck, Ph.D., and Edwin D. Lyman, M.D., reprinted from the *American Journal of Pharmaceutical Education*; "Are Animal Experiments Needed?" by S. C. Ivy and S. F. Zobel, reprinted from the *Journal of the American Pharmaceutical Association*; "Operation X—Survival," by Albert Q. Maisel, reprinted from *Readers Digest* and condensed from *Hygeia*, and finally a "Pledge for Antivivisectionists" (author not reported). Presumably all of these items are yours for the asking from the National Society for Medical Research, 25 E. Washington St., Chicago 2, Ill.

The pledge we give you in full:

I am unequivocally opposed to experimentation on animals in medical research. In protest against this practice I pledge myself and my children to refrain from making use of any of the knowledge gained through research in which animals were used:

1. I shall examine with extreme suspicion all medical knowledge.
2. If I or my children become diabetic I shall not use insulin.
3. If I am afflicted with pernicious anemia I shall not use liver extract.
4. I shall never accept a blood transfusion.
5. Vitamins will be as poison to me.
6. I shall use no drugs which have first been tested on animals for strength and purity.
7. If an operation is necessary I shall repudiate anesthesia.
8. These operations shall be anathema to me and mine—
  - a. On the heart and its valves
  - b. On the lungs
  - c. On the blood vessels
  - d. On the brain
  - e. On the stomach and intestines
  - f. On the ovaries and womb
9. If my child is afflicted with rickets I shall look away in pity.
10. I shall not allow my children to be immunized against diphtheria but shall allow them to strangle with this disease.
11. I shall avoid sulpha drugs and penicillin as I would the plague.\*
12. I shall make out my will immediately.

Signed .....

\* A definite policy on the plague will be announced later.

#### HERMANN M. BIGGS AND THE HEALTH CENTER IDEA

Few public health workers are much concerned with the historical background of their subject and it is only seldom that items of special public health interest appear in the *Bulletin of the History of Medicine*.

The October, 1946, number (Volume XX, No. 3, pp. 387-412) contains an excellent article by Milton Terris, M.D., M.P.H., of Bethesda, Md., on "Hermann M. Biggs' Contribution to the Modern Concept of the Health Center." Dr. Terris believes that the outstanding

contribution to the development of the modern concept of the health center in the United States was made by Dr. Hermann M. Biggs of New York State more than twenty-five years ago. It was brought into sharp relief by the influenza epidemic of 1918 which focused attention on the serious shortage of medical personnel and facilities in the rural sections of New York State.

This well documented review assembles significant information which ought to be accessible to all, and it includes the original memorandum on health centers proposing a bill authorizing a county, city, or consolidated health district to create and maintain one or more health centers with the assistance of state aid.

#### CHAMBER OF COMMERCE SUGGESTS HEALTH MEASURES

The Health Advisory Council of the U. S. Chamber of Commerce recently sent to its local chambers suggested news releases adapted for local health committee uses. Two included the recommendations of the American Public Health Association, as given in *Control of Communicable Diseases* on the common cold and influenza; another pointed out the community and dollar dividends resulting from adequate public health expenditures; and another, designed especially for areas with small industrial plants, suggested a joint industrial health plan covering several small plants. Properly used by local communities these represent a significant widening of health education influence.

The Chamber has also issued a recent summary on How Chambers of Commerce Are Attacking on the Health Front. This summarizes, by way of illustration, activities of some of the local chambers in furthering the health work of their communities.

## BOOKS AND REPORTS

*All reviews are prepared on invitation. Unsolicited reviews cannot be accepted. All books reviewed in these columns may be purchased through the Book Service.*

**Five Million Patients**—By Allen W. Freeman, M.D. New York: Scribners, 1946. 299 pp. Price, \$3.00.

Straight forward, systematic, common sense, personal modesty, professional pride, or at least deep satisfaction; such are the words that come to the tongue or pen while reading this matter-of-fact autobiography of our friend from student to professor. One would not look for embroidery in the texture of so simple a tale of a characteristic life, and one finds none. Its beauty of pattern and the simplicity of its philosophy call for more of the embellishments of stories written to sell.

In the three hundred pages we find a narrative in episodes "as true as the author can make it." Each of the one hundred and eleven glimpses into the happenings of forty-five years is so brief as to leave the reader always with an appetite for more. We join the student as he enters his medical school and share his progress of hard work through fifteen illustrations of a well established academic discipline until he has earned his medical degree. The apprentice, as he nominates his rôle for three years, takes us with twenty hops through hospital and into practical public epidemiology. Book III gives us fifty micro-photos of The Journeyman while he moves swiftly over the thirteen years that make him a national leader in administrative experience and give him the length, breadth, and depth of public health that prepared him for the next leap ahead. In the fourth book there are twenty-six views of The Professor at home and abroad from 1921 to 1945.

Five million is a good round figure for home folks, but the patients or per-

haps the clients of such a servant of the sciences of preventive medicine and of civil government, their necessary partner, are not to be counted in so modest a seven numbers.

Allen Freeman is the same in print as in action and in human relations. He has once again put us all in his debt. If we incline to complain it is of the matters within his years which he has passed over without remark. In his writing, as in the way of his work, he has shown how he is strong in the reserves he does not make public, in the resources he decides to hold for another occasion.

A man of industry, disciplined by origin, by education, by his profession and by his innumerable contacts in all walks of life. A life is here recorded for the pleasure and serious thought of a host of readers, doctors and patients.

HAVEN EMERSON

**The Control of Venereal Disease**—By R. D. Vonderlehr, M.D., and J. R. Heller, Jr., M.D. New York: Reynal & Hitchcock, 1946. 246 pp. Price, \$2.75.

This volume presents in non-technical language for the general reader a report to the nation of the origin and progress and present status of venereal disease control in the United States.

Here will be found things that the public should know: the tremendous interest aroused during the first world war; the long period of apathy until the problem was again forcibly brought to light by the Surgeon General of the United States Public Health Service; the progress made in venereal disease control from the reawakening to the

outbreak of the second world war; the importance of the repression of prostitution and prevention of juvenile delinquency; and the value of coördinated activities of allied agencies in presenting a solid front against the venereal diseases.

The discussions on prostitution and juvenile delinquency, and of psychologic and psychiatric aspects of the venereal diseases deserve special mention. Prior to the recent war, venereal disease programs were directed almost entirely to standard medical and public health practices, without reference to the moral side of the problem. Experience during the war showed conclusively that venereal diseases cannot be controlled by medical measures alone in the face of increasing sexual promiscuity. The importance of determining behavior patterns as a guide to venereal disease control activities is clearly shown in the chapter on Venus and Psyche.

It is predicted that, unfortunately, this book will not be widely read by the public. It behooves those engaged in public health work to transmit its message. As a source of material and methods for its presentation to the lay public, the health officer will find this volume very useful.

WILLIAM A. BRUMFIELD, JR.

**Eye Health—A Teaching Handbook for Nurses—***Published by The National Society for the Prevention of Blindness, Inc., 1946. 108 pp. Price, \$.60.*

The book is "designed to provide the nursing profession with background information on aspects of eye health." In a readable style it gives a compact review of useful data ranging from the structure of the eyes through eye health in childhood and adult ages to suggested teaching opportunities for the nurse.

The format follows one of the rules for maintaining eye health by using dull-finished cream-tinted paper, wide page

margins, plain sharp-edged type of proper size and spacing. The cross references and index, as well as the brief annotated bibliography are helpful to the reader.

This book should be of interest to nurses in all phases of community service.

KATHERINE E. PAYNE

**Psychiatric Interviews with Children—***By Helen Leland Witmer. New York: Commonwealth Fund, 1946. 443 pp. Price, \$4.50.*

This volume is addressed to the students of psychotherapy of children and to practitioners of child psychiatry, but it can be read with profit by many others, including physicians, nurses, teachers, and parents. The methods used in child guidance clinics have never been well understood by those not directly concerned. Yet it is important that the doctor and the teacher and the nurse who come first into contact with children needing specialized attention should understand at least the background technics and be able to select cases wisely for referral.

These ten case records from eight different clinics will serve the public-health professions and doubtless be of interest as well to the specialists in this field, for there are several schools of thought represented. Beside the case reports Dr. Witmer, who comes from the Smith College School for Social Work, describes the general content of psychotherapy in child guidance clinics. Each therapist reporting here has "attempted to show the significant words and actions, and the reasons underlying them, by which he and his patient worked through to a satisfactory solution of the problems that brought the child to the clinic. In this process the therapists were usually assisted by psychiatric social workers, for it is the child guidance assumption that most psychiatric problems in children represent a maladjustment in family life. A child, these

practitioners believe, can rarely be helped unless the parents achieve a new orientation toward him, one that supports him in his efforts to relate himself to people more satisfactorily than before." It is the working out of this conception of psychiatric treatment that is demonstrated in the case records in this book. The volume is easy to read and well worth the effort. It takes some of the mystery out of child guidance and suggests that the therapists have a normal supply of common sense.

REGINALD M. ATWATER

**Food Values of Portions Commonly Used**—By *Anna dePlanter Bowes and Charles F. Church, M.D.* (6th ed.) Philadelphia: College Offset Press, 1946. 58 pp. Price, \$1.60.

The purpose of this book is to supply authoritative data on food values to workers in the fields of medicine, dentistry, dental hygiene, public health nursing, and nutrition. A distinctive feature of the book is its well organized, readily available information on commonly used portions of a large variety of foods.

The fact that this booklet has gone through six revisions in nine years testifies to its wide acceptance and use by professional group leaders. Important changes in the new edition are: all food tables rewritten; staple foods of other countries added; recipes for all prepared foods recalculated to include new food values of ingredients.

ETHEL AUSTIN MARTIN

**Insight and Personality Adjustment**—By *Therese Benedek, M.D.* New York: Ronald Press, 1946. 301 pp. Price, \$4.00.

The psychoanalysts seem to be emerging from their darkened consultation rooms to have a look at sociological problems. The author of this book, who is a member of the Institute of Psychoanalysis in Chicago, has been stimu-

lated to study the problems of a war-time society as they affect the individual who is involved in that war.

Dr. Benedek's book is about the psychological influences of war upon the soldier, veteran, his wife and family. She has described admirably the psychological trauma inflicted upon the wife and family of the soldier but has drawn on meager data to cover the problems of the soldier. Perhaps this part of the story should have been left to those who were more intimately associated with psychiatric work of the Army and Navy medical services. Unfortunately, the emotional problems of the many men who were classified as "militarily unsuitable" and other 4 F's were not discussed in the book. The author's analysis of family problems arising from the war's impact is vivid but somewhat depressing. The reader is left to find his only solace in the realization that so many of our veterans have penetrated successfully the emotional pitfalls of war and are now making such good adjustment in the post-war world.

CHARLES E. SHEPARD

**The Fever Bark Tree**—By *M. L. Duran-Reynals.* New York: Doubleday, 1946. 274 pp. Price, \$2.75.

*The Fever Bark Tree* is a historical chronological record of the discovery of the bark of the cinchona tree and its development in the treatment of malaria. The period covered is that from the romantic time of the Spanish Dons and their laden galleons down to the present day, with the Indians and their gods guarding those stately trees, a vital and picturesque element of the pageant.

Built upon the framework of the record of medical, botanical, religious, and industrial endeavor, the author has presented to her readers in an interesting manner the interrelationship of the drug's discovery to human frailties and virtues existent throughout the ages.

Intrigue, ignorance, humanitarianism, quackery, loyalty, philanthropy, religion, and intransigence are portrayed vividly in their rôle in the drama of the drug's turbulent development.

Documented with a special section on bibliography, the book should serve as an additional source of reference to clarify many previous, apparently erroneous legends.

It is perhaps regrettable, from the standpoint of the lay reader, whether through intention or not, that the rôle of quinine as a suppressive measure against symptoms and as a curative agent is not accentuated in contradistinction to its lack of potency in killing the form of the parasite as injected into man by the anopheline mosquito.

JOHN E. ELMENDORF

**Body Mechanics in Nursing Arts**  
—By *Bernice Fash*. New York: McGraw-Hill, 1946. 130 pp. Price, \$2.75.

This is a most welcome little handbook for quick reference. The first section introduces individual tests of principles in body mechanics and the demonstration sketches are excellent; they are understandable even for the novice.

Section two deals with specialized nursing skills under improved work habits. These reduce fatigue factors, often so pronounced in the midst of a thousand and one things the nurse is called upon to do.

Valuable also are the chapters on body mechanics of the business and plant worker. They offer a wider scope of teaching material for the health educator and should benefit the nurse who has to give much of her time to clinical instruction. The generous use of illustrations is most commendable.

This manual should be a welcome accessory in any nursing library and for any branch of nursing. However, it should not replace the textbooks on nursing skill, which give greater tech-

nical detail, but it does contain material which is scientific and concise.

LOUISE L. ROEDER

**Cancer Can Be Cured**—By *Alfred J. Cantor, M.D.* New York: Didier, Publishers, 1946. 175 pp. Price, \$2.50.

This volume is a short treatise on the prevention and curability of cancer for lay readers. Much of its information is sound, but occasionally an unproved hypothesis has been advanced as an accepted fact, and in some parts of the book there is a tendency toward over-emphasis. The book is easy to read but inclined toward the dramatic. Absurd suggestions are interspersed with sound statements. For example, the admonition to consult a physician at least yearly for a thorough examination does not seem to have the same tenor as the advice to protect yourself from tobacco smoke by tearing cigarettes, cigars, and pipes from those individuals near you who are smoking.

The book is too elementary for physicians and public health workers. It is written from too emotional a viewpoint for the analytical layman. It may be well received by that part of the public which enjoys graphic and emotional presentations, and among this group lives may be saved.

HERBERT L. LOMBARD

**Greenwich (Conn.) Community Program "Eat a Good Breakfast" Campaign**—*Greenwich Nutrition Committee. Greenwich, Conn.: Greenwich Tuberculosis and Health Assoc., 1946. 124 pp.*

This report of a community nutrition project conducted at Greenwich, Conn., includes the details of every step in the campaign; pictures of local committees, participating groups and numerous exhibits along with samples of all the posters and pamphlets used, replicas of newspaper publicity, letters soliciting

coöperative action and letters received. Few of the ideas are new, but the report shows how good ideas from many sources may be used by community agencies coöperating to promote such a health project.

The publication would seem to be of primary interest to the local community where the project was undertaken with its obvious purpose that of giving credit to local effort. It might serve as a guide to another community wishing to undertake a similar project.

HELEN S. MITCHELL

**Practical Malariology**—By *Paul F. Russell, M.D., Luther S. West, Ph.D., and Reginald D. Manwell, Sc.D.* Philadelphia: Saunders, 1946. 684 pp. Price, \$8.00.

This book is a well balanced presentation of its subject, and will be an indispensable tool for all who work in its special field and related subjects. The medical, entomological, and engineering phases of the disease and its control are admirably handled within the limits of a single text.

Chapters 6 and 7 on the morphology and bionomics of mosquitoes are exceptionally good. In Chapter 8, on the Distribution of Anophelines, the tables of important vector species, while good, probably contain some minor errors, e.g., in the table on page 188 it is doubtful that *A. labranchiae atroparvus* occurs in Japan. Chapters 16, 17, and 18 on the epidemiology of malaria are the best presentations this writer has seen since L. W. Hackett's classic.

In Chapter 22 on Larvicides, a fuller treatment of emulsifiers would have been helpful to field control personnel. In Chapter 25 on Control of Adult Mosquitoes (at pp. 523-525) a more complete treatment of DDT residual would have been desirable. This new effective adulticide is radically changing our ideas as to methods of control of both culicine and anopheline species.

In Chapter 26, the importance of educational measures would justify a considerable expansion of this section (pp. 541-545) and its segregation into a separate chapter.

The entomological keys in the Appendix are excellent of their type, but occupy 71 pages. Diagrammatic or pictorial keys of the type developed by the Malaria Control in War Areas unit of the U. S. Public Health Service would have been equally exact and more clear and compact than the conventional type of taxonomic key.

The typography and format of the book are unusually good, the numerous photographic illustrations are exceptionally clear and well selected, and the line drawings excellent.

The dedication of the book to the malaria control organizations of our armed forces in World War II is a well deserved tribute to a fine group of unsung heroes.

H. F. GRAY

**Industrial Toxicology**—By *Alice Hamilton and Rutherford T. Johnstone.* New York: Oxford University Press, 1945. 72 pp. Price, \$3.50.

In this day of elaborate treatises reaching encyclopedic proportions, many practitioners and specialists in the field of industrial health will welcome this refreshingly concise summary of the pathology, diagnosis, treatment, and prevention of occupational diseases. Dr. Hamilton presents pathology and diagnosis in Part I, and Dr. Johnstone discusses treatment and prevention in Part II. Part III is a bibliography of 352 items.

Of special interest to this reviewer is the statement: "It should be reiterated constantly that the primary treatment is prevention." Recommendations for preventing occupational diseases are generally sound and practical, but the authors are tempted at certain points to be overly specific on engineering details.



Readers will appreciate the care with which the authors have studied the amassing literature in this field, and the way in which they have recorded their experienced judgment on significant developments.

WILLIAM N. WITHERIDGE

**Manual for School and Institutional Lunch Rooms (revised)**—*Ohio Dietetic Association. Cleveland: Ohio Dietetic Association, 1946. 222 pp. Price, \$2.00 (\$1.85 for 3 or more).*

This is a revision of *Manual for Managers of Rural and Other Small School Lunch Rooms*, reviewed in this *Journal*, Vol. 32 (Aug.), 1942, p. 881. The name was changed because the material is valuable for use in urban institutions and schools, as well as in rural schools. The material is uniquely suited to fit the needs of the untrained workers, who, more times than not, are respon-

sible for the food service in schools and child caring institutions.

The untrained worker will find the general information preceding the recipe section very helpful—this includes a table of miscellaneous equivalents of weights and measures, some common food measurements, the average number of servings obtained from common staples, and information on the use of dehydrated milk solids.

Simple directions and suggested forms for cost accounting are included. The section on *Location of Lunchroom* includes floor plans for use in school buildings where expansion is impossible.

The section on *Equipment* has been revised and a few new recipes have been added.

This might well be used as the standard manual in school systems that do not have manuals of their own.

ALICE H. SMITH

## BOOKS RECEIVED

*Listing in this column acknowledges the receipt of books and our appreciation to the senders. Space and the interests of readers will permit review of some, but not all, of the books listed.*

**AGING SUCCESSFULLY.** By George Lawton. New York: Columbia University Press, 1946. 266 pp. Price, \$2.75.

**CHILDREN IN THE COMMUNITY** (The St. Paul Experiment in Child Welfare). By Sybil A. Stone, Elsa Castendyck, and Harold B. Hanson, M.D. Washington: Gov. Ptg. Office, 1946. 182 pp. Price, \$35.

**COMMUNITY CENTERS AS LIVING WAR MEMORIALS.** By James Dahir. New York: Russell Sage Foundation, 1946. 63 pp. Price, \$50.

**CONTROL OF RINGWORM OF THE SCALP AMONG SCHOOL CHILDREN IN HAGRESTOWN, MARYLAND, 1944-45.** By Louis Schwartz, *et al.* Washington: Gov. Ptg. Office, 1946. 27 pp. Price, \$10.

**THE COST OF SLUMS IN NEWARK.** By Jay Rumney, Ph.D., and Sara Shuman, M.A. Newark, N. J.: Housing Authority of City of Newark, 1946. 36 pp.

**DDT AND THE INSECT PROBLEM.** By James C. Leary, *et al.* New York: McGraw-Hill, 1946. 176 pp. Price, \$2.50.

**DESIGN FOR SAFE LIVING.** New York State Department of Health. New York: Reinhold Publishing Corp., 1946. 16 pp.

**DEVIL BY THE TAIL.** By Langston Moffett. Philadelphia: Lippincott, 1946. 431 pp. Price, \$3.00.

**THE DUKE ENDOWMENT YEARBOOK No. 14.** The Duke Endowment. Charlotte, N. C.: The Duke Endowment, 1946. 41 pp.

**THE FORCES THAT SHAPE OUR FUTURE.** By Clyde Eagleton. New York: New York University Press, 1945. 200 pp. Price, \$3.25.

**THE FREEZING PRESERVATION OF FOODS** By Donald K. Tressler and Clifford F. Evers. (2nd ed.) New York: Avi Publishing Co., 1946. 932 pp. Price, \$10.00.

**A HANDBOOK OF SOCIAL MEDICINE.** By Fred

- Grundy. London: Gibbs, Bamforth & Co., Ltd., 1946. 179 pp. Price, 8/6.
- HEALTH EXAMINATIONS—A MANUAL FOR THE GENERAL PRACTITIONER. Prepared for The Medical Society of the County of New York by The Special Committee on Preventive Medicine. 144 pp.
- HEALTH INSURANCE IN THE UNITED STATES. By Nathan Sinai, *et al.* New York: Commonwealth Fund, 1946. 115 pp. Price, \$1.50.
- THE HEALTH OF WILLESDEN. By George F. Buchan, M.D. London: Health Dept. of Borough of Willesden, 1946. 20 pp.
- HOW CAN WE TEACH ABOUT SEX? By Benjamin C. Gruenberg. New York: Public Affairs Committee, Inc., 1946. 32 pp. Price, \$1.00.
- I DIE DAILY. By Lorna Doone Burks. New York: Rockport Press, Inc., 1946. 208 pp. Price, \$3.00.
- LAYOUT, BUILDING DESIGNS, AND EQUIPMENT FOR Y.M.C.A. CAMPS. Prepared under direction of John A. Ledlie. Building & Furnishing Service National Board, Y.M.C.A. New York: Association Press, 1946. 48 pp. Price, \$3.00.
- LIVING TOGETHER IN THE FAMILY. By Margaret Weigley Wood. Washington: American Home Economics Association, 1946. 256 pp. Price, \$2.00.
- MEDICAL SOCIAL SERVICE IN TUBERCULOSIS CONTROL. U. S. Public Health Service. Washington: U. S. Gov. Ptg. Office, 1946. 22 pp.
- THE MONEY VALUE OF A MAN. By Louis I. Dublin and Alfred J. Lotka. (Rev.) New York: Ronald Press, 1946. 214 pp. Price, \$6.00.
- MUSCLE TESTING—TECHNIQUES OF MANUAL EXAMINATION. By Lucille Daniels, *et al.* Philadelphia: Saunders, 1946. 189 pp.
- THE NATIONAL FORMULARY. Washington: American Pharmaceutical Association, 1946. 850 pp. Price, \$7.50.
- NEGRO HOUSING NEEDS. By Joseph H. Bunzel. Pittsburgh, Pa.: Pittsburgh Housing Association, 1946. 32 pp. Price, \$.50.
- NURSING CARE IN CHRONIC DISEASES. By Edith L. Marsh. Philadelphia: Lippincott, 1946. 237 pp. 28 illus.
- PARAGUAYAN RURAL LIFE—SURVEY OF FOOD PROBLEMS. Washington: Institute of Inter-American Affairs, Food Supply Division, 1946. 130 pp.
- THE PERSONALITY OF THE PRESCHOOL CHILD. By Werner Wolff, Ph.D. New York: Grune & Stratton, 1946. 341 pp. Price, \$5.00.
- PLANNING FOR THE CARE OF THE CHRONICALLY ILL IN NEW YORK STATE—REGIONAL ASPECTS. New York State Commission. Albany: Williams Press, 1946. 85 pp.
- PSYCHIATRIC INTERVIEWS WITH CHILDREN. By Helen Leland Witmer. New York: Commonwealth Fund, 1946. 443 pp. Price, \$4.50.
- 1946 PUBLIC WORKS CONGRESS REPORTS BULLETIN No. 38. Chicago: American Public Works Association, 1946. 151 pp. Price, \$.50.
- RED CROSS SERVICE RECORD—ACCOMPLISHMENTS OF SEVEN YEARS, 1939-1946. Washington: American National Red Cross, 1946. 105 pp.
- THE REHABILITATION PROGRAM AT THE MUNICIPAL SANATORIUM, OTISVILLE, N. Y. By I. D. Bobrowitz, M.D., and Joseph Newman. New York: National Tuberculosis Association, 1946. 77 pp.
- REHABILITATION OF THE TUBERCULOUS (PROCEEDINGS OF CONFERENCE). Edited by Holland Hudson and Norvin C. Kiefer, M.D. New York: National Tuberculosis Association, 1946. 138 pp.
- A REPORT OF PUBLIC WELFARE IN HAWAII (Jan. 1, 1945, to June 30, 1946). By John H. Wilson. Honolulu, T.H.: Dept. of Public Welfare, 1946. 46 pp.
- REPORTS OF OFFICERS FOR THE FISCAL YEAR ENDED SEPTEMBER 30, 1946. Carnegie Corporation of New York, 1946. 90 pp.
- STUDIES ON THE RELATIVE RESISTANCE OF GERMS TO THE SALTS OF METALS OF GROUP I OF THE PERIODIC TABLE, by A. R. Alha (74 pp.), and ÜBER DIE WIRKUNG DER METALLCHLORIDE DER ZWEITEN GRUPPE DES PERIODISCHEN SYSTEMS AUF VERSCHIEDENE MIKROORGANISMEN, by Rolf Koulumies (99 pp.). Ejnar Munksgaard, København, 1946.
- STUDY GUIDE FOR INDIVIDUAL AND CLASS PROGRAM FOR CHILDREN OF LOWERED VITALITY. William H. Bristow, Chairman, Committee for Preparation of Study Guide. New York: Dept. Educational Nursing, Community Service Society, 1946. 42 pp.
- TUBERCULOSIS CONTROL IN NEW JERSEY. New Jersey Tuberculosis League, Inc., 1946: 45 pp.
- TUBERCULOSIS IN THE UNITED STATES. National Tuberculosis Association, 1946. 189 pp.
- TUTORING AS THERAPY. By Grace Arthur, Ph.D. New York: Commonwealth Fund, 1946. 125 pp. Price, \$1.50.
- YOUNG MINDS WITH OLD BODIES. By Melvin E. Page, D.D.S. Boston: Bruce Humphries, Inc., 1946. 184 pp. Price, \$2.50.

## A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

**Grim Note** — Incidence of second-attack poliomyelitis appears to be high enough to cast doubt on the existence of clinical immunity following an attack of the disease. So don't expect acquired immunity alone to protect persons in contact with patients. Health administrators, please note.

BRIDGE, E. M., *et al.* Clinical Immunity in Poliomyelitis. *Am. J. Dis. Child.* 72, 5:501 (Nov.), 1946.

**Primitive and Antisocial**—Probably there is less than a nickel's worth of really "useful" information for you in this paper, but if you have a normally morbid curiosity you'll find it readable. You'll agree with the author that the person who has none of the listed signs of the psychopathic personality must be a saint. He says that most of us fall somewhere between the psychopath and the saint. How about you?

CASON, H. The Symptoms of the Psychopath. *Pub. Health Rep.* 61, 51:1833 (Dec. 20), 1946.

**In Addition to the Mother's Comfort**—In comparable groups there were fewer stillbirths and deaths-during-the-first-week among infants born of mothers receiving continuous caudal analgesia than among the controls. If the method could be applied to all deliveries, and with the same results, the present estimated loss of 125,000 viable infants through these causes could be cut in half, the writers suggest.

COLLINS, S. D., *et al.* A Statistical Study of Delivery with Continuous Caudal Analgesia as Compared with Other Methods. *Pub. Health Rep.* 61, 48:1713 (Nov. 29), 1946.

**"Epidemical and Other Disorders"**

—Just a century ago the first British Medical Officer of Health took office—in Liverpool. The tragic events leading to his appointment and the formidable job he undertook are recounted. This whole story may already be in the history books, for all I know, but if it isn't you may want this reference.

DALEY, A. One Hundred Years—A Retrospect and a Forecast. *Pub. Health.* 60, 2:28 (Nov.), 1946.

**We Can Afford the Wastage**—In Saskatchewan, all tuberculin negative nurses and other sanatorium personnel were given the benefit of BCG vaccination—a protection we reserve for our red Indians but fail to give exposed professional workers. In Canada, too, the protection, though not perfect, was found to be of the order of 4 or 5 to 1.

FERGUSON, R. G. BCG Vaccination in Hospitals and Sanatoria in Saskatchewan. *Canad. Pub. Health J.* 37, 11:435 (Nov.), 1946.

**A Word of Caution**—Tuck away these sentences in the card-file of your memory, "It is unwise to send any person to a sanatorium who is merely suspected of having pulmonary tuberculosis. Not until tubercle bacilli are demonstrated should a patient be sent to the sanatorium for treatment." They are from a useful paper reminding health workers what to do with persons with abnormal chest x-rays.

HILLEBOE, H. E., and HOLM, J. Guide for Disposition of Persons with Abnormal Pulmonary Findings on X-Ray Films. *Pub. Health Rep.* 61, 49:1759 (Dec. 6), 1946.

**Four Will Do It**—Reported here is a study to determine the smallest effective number of topical applications of sodium fluoride. An earlier researcher

had used from 7 to 15 applications. Apparently at least 4 are needed to produce the same benefits.

JORDAN, W. A., *et al.* The Effects of Various Numbers of Topical Applications of Sodium Fluoride. *J. Am. Dent. A.* 33, 21: 1385 (Nov. 1), 1946.

**For Kindergartners** — Now, it seems, we'll add a "booster" dose of pertussis vaccine to the supplementary diphtheria prophylaxis just before the child starts to school when exposure to whooping cough is greatly increased. Evidence presented lends support to the proposal, at any rate.

KENDRICK, P., *et al.* Re-enforcing or "Booster" Injection of Pertussis Vaccine in Previously Immunized Children of Kindergarten Age. *Am. J. Dis. Child.* 72, 4:382 (Oct.), 1946.

**Floating TB Bacilli** — Described here are some relatively simple experiments that show tuberculosis to be an air-borne infection and that ultraviolet rays destroy the floating bacilli. There is no reason, concludes the writer, why both ultraviolet radiation and oil treatment of bedclothes and floors should not be used in tuberculosis hospitals. None, except human inertia!

LURIE, M. B. Control of Air-borne Contagion of Tuberculosis. *Am. J. Nursing.* 46, 12:808 (Dec.), 1946.

**Not Rules—But Principles**—The cook, the plumber, and the lab technician follow rules, but handling people is an art. So says a convention headliner whose paper can be read with benefit by anybody who has one or more people working with, or under, him. That category must include about everyone in the health field but me—and I enjoyed it too.

MAGOUN, F. A. New Ways in Personnel Administration. *Pub. Health Nurs.* 38, 11: 591 (Nov.), 1946.

**Boxing the Compass** — Every so often, we swing round again to the disuse theory of dental decay. Make

people chew tough meat and tough crusts and all will be well, insists this British proponent of that theory. Disuse, he says, results in decalcification of teeth as it does bones, so he coins the name "disuse odontoporosis" which you may employ without credit if you wish.

NEUMANN, H. H. Food Habits and Dental Caries. *J. Roy. Inst. Pub. Health & Hyg.* 9, 12:373 (Dec.), 1946.

**Stirring Times: Challenging Opportunities** — Our nation's progress toward solid health administration and the needs yet to be met are briefly told by the one man best situated to see clearly the whole enormously complex problem.

PARRAN, T. National and International Horizons in Health. *Pub. Health Nurs.* 38, 11:583 (Nov.), 1946.

**Wise Words of Warning**—All persons, before being given influenza vaccine should be tested intradermally for allergy. Profound, and fatal, anaphylaxis is not unknown; that must never be forgotten. What to do in all the varying degrees of reaction to the test is set forth in this paper.

RATNER, B., and UNTRACHT, S. Allergy to Virus and Rickettsial Vaccines. *J.A.M.A.* 132, 15:899 (Dec. 14), 1946.

**Hygienic Significance of Dust Laying**—A discussant says, "Dr. Smith and his associates know more about coccidioidomycosis than any one else." So, if you want to learn more about the epidemiology of this jaw-breaker than what was covered in a paper on this subject in the December issue of our *Journal*, then this earlier paper should be read too.

SMITH, C. E., *et al.* Effect of Season and Dust Control on Coccidioidomycosis. *J.A.M.A.* 132, 14:833 (Dec. 7), 1946.

**A Little of This and That**—Hematology, tropical medicine, infectious diseases, endocrinology, virus diseases, among other subjects are skimmed

in an informal, readable, round table. Not to be missed.

STURGIS, C. C., *et al.* Therapeutic "Information Please." J.A.M.A. 132, 16:963 (Dec. 21), 1946.

**As Others See Us**—"To the British mind the first reaction to some of these (American V.D. publicity stunts) is one of surprise mingled with amusement. On consideration, however, it is readily perceived that it is all the logical pursuance of an accepted line of thought. Venereal disease must be reduced and stamped out."

WILLCOX, R. R. Some American Ideas on Venereal Disease Control. Brit. M. J. No. 4482, p. 825 (Nov. 30), 1946.

**"They Have Come to Stay"**—There are papers one reads for profit; others for pleasure—yes, even in the scientific press! If you'll read this one, your pleasure is assured, because it has eloquence, humor, persuasiveness. Incidentally, you may derive a little profit from it. Who knows?

WINSLOW, C.-E. A. The Voluntary Nursing Agency. Pub. Health Nurs. 38, 11:608 (Nov.), 1946.

*Seventy-fifth Annual Meeting*

*American Public Health Association*

*Atlantic City, N. J.*

*Week of October 6, 1947*

## ASSOCIATION NEWS

### APPLICANTS FOR MEMBERSHIP

*The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.*

#### *Health Officers Section*

Vincent D. Bove, M.D., 1331 Moore St., Philadelphia 48, Pa., Medical Officer, Division of Communicable Diseases, Bureau of Health

Chong-teh Chang, M.D., CNRRA Regional Office, Taiyuan, Shansi, China, Director of Provincial Health Administration

Charles C. Demmer, M.D., Dr.P.H., 55 Stevens St., Wellesville, N. Y., Visiting Professor (General Epidemiology), School of Public Health, Univ. of North Carolina

Gordon F. Fisher, M.D., 1811 Shoreline Blvd., Corpus Christi, Tex., Director, City-County Health Unit

Nicholas R. Frankovelia, M.D., 6547 W. Pershing Rd., Berwyn, Ill., Health Director, Stickney Township Health District

Dudley A. Reekie, M.D., M.P.H., 128 W. Commerce St., San Antonio, Tex., Director of Health, City Health Dept.

Hartwin A. Schulze, M.D., M.P.H., OTCS Hqs. USFET, APO 757, New York, N. Y., Chief, Preventive Medicine Division

Charles D. Shields, M.D., M.P.H., 1002 Parkside Ave., Buffalo 16, N. Y., Commissioner of Health, City of Buffalo

Vergil N. Slee, M.D., 592 Mower Rd., Pinckney, Mich., Student, School of Public Health, Univ. of Michigan

Lt. Col. Lucius G. Thomas, M.C., Public Health and Welfare Section, GHQ, SCAP, APO 500, San Francisco, Calif., Chief, Preventive Medicine Division

#### *Laboratory Section*

Milton H. Brown, M.D., D.P.H., 89 Breadalbane St., Toronto, Ont., Canada, Professor of Hygiene and Preventive Medicine, Univ. of Toronto

Virginius E. Brown, Ph.D., P. O. Box 217, Grayson St., P. O., San Antonio, Tex., Parasitologist, Brooke Medical Center, U. S. Army

Shirley J. Gens, 1101 Elder St., Houston, Tex., Assoc. Serologist, Houston Public Health Laboratory

Robert F. Jaeger, 1424 South First, Springfield, Ill., Serologist, State Dept. of Public Health

Capt. Lester Kiefer, Fourth Medical Laboratory, APO 175, New York, N. Y., Chief of Serology and Virology

Alexander Kimler, M.S., 1226 Drexel Ave., Miami Beach, Fla., Bacteriologist, Veterans Administration Hospital

Milton Marmell, M.A., 110 Empire Blvd., Brooklyn, N. Y., Bacteriologist, Rikers Island Hospital

Clinton C. McDonald, Ph.D., Univ. of Wichita, Wichita 6, Kans., Director of Student Health Service

Robert A. Milner, 15 Washington St., Concord, N. H., Senior Bacteriologist, State Dept. of Health

Filiberto Ramirez-Corria, M.D., Av. 9 Num. 9 Esq. 6, Buenavista, Havana, Cuba, Pathologist, Finlay Institute

Beatrice L. Shepard, General Delivery, Juneau, Alaska, Bacteriologist, Territorial Bureau of Health

Thelma D. Sullivan, M.A., 3001 Bonnie Rd., Austin, Tex., Bacteriologist, State Bureau of Health Laboratories

Dorothy M. Wendt, City Laboratory, 1101 Elder St., Houston 10, Tex., Assoc. Bacteriologist, State Dept. of Health

Leslie H. Wetterlow, 98 Hillcrest Parkway, Winchester, Mass., Asst. Bacteriologist, State Dept. of Public Health

Daniel Widelock, Ph.D., 125 Worth St., New York 13, N. Y., Chief of Serology, Bureau of Laboratories, City Dept. of Health

#### *Vital Statistics Section*

LaMont C. Cole, Ph.D., Indiana Univ., Dept. of Zoölogy, Bloomington, Ind., Instructor in Zoölogy

Dorothy D. Helm, 4137 Manila Ave., Oakland 9, Calif., Assoc. in Public Health, School of Public Health, Univ. of California

Irving Levin, M.A., 3231 79th St., Jackson Heights, N. Y., Statistician, Union Health Center

*Engineering Section*

- George O. Culli, Jr., 3018 Austin St., Corpus Christi, Tex., Supervisor of Shellfish Sanitation, State Dept. of Health
- T. C. Easaw, Senior Health Inspector, Johore Bahru, Malaya, S. S., Health Dept., Johore State
- William L. Hafner, 1229 W. Washington Blvd., Chicago 7, Ill., Office Manager, Wallace and Tiernan Co.
- William T. Linton, M.S.P.H., 433 Wade Hampton Office Bldg., Columbia, S. C., Senior Sanitary Engineer, State Board of Health
- Terence K. McCormack, 27 N. Grand Ave., Baldwin, Long Island, N. Y., Junior Sanitary Engineer, Nassau County Dept. of Health
- George C. Scott, 5810 Ellsworth St., Dallas 6, Tex., City Health Inspector
- Stanley B. Stolz, 34 South St., Middletown, N. Y., Asst. District Engineer, State Dept. of Health
- Ralph C. Sweeney, 34 South St., Middletown, N. Y., District Sanitary Engineer, State Health Dept.
- Clarence L. Taylor, 620 E. 42nd St., Indianapolis 5, Ind., Superintendent of Community Sanitation, Board of Public Health and Hospitals
- Clarence P. Thayer, 4212 N.W. 6th Ave., Miami, Fla., Senior Sanitary Officer, Dade County Health Unit

*Industrial Hygiene Section*

- Charles F. Bond, M.S., 1519 Cedar Lane, Nashville 5, Tenn., Senior Industrial Hygiene Chemist, Industrial Hygiene Service, State Dept. of Public Health
- Gerald Friedman, 158 Central Ave., Spring Valley, N. Y., Laboratory Technician, Lederle Laboratories
- Glenn D. Hutchinson, M.D., 1557 ElDorado St., Vallejo, Calif., Graduate Student, School of Public Health, Univ. of California
- John KoVace, 1240 Ontario St., Cleveland, Ohio, Editor, Occupational Hazards
- Robert B. Sutherland, M.D., 97 Elmsthorpe Ave., Toronto 12, Ont., Canada, Staff Member, Ontario Division of Industrial Hygiene

*Food and Nutrition Section*

- Elsbeth E. Bennett, M.A., Ralston Purina Co., Checkerboard Square, St. Louis, Mo., Manager, Nutrition Service
- Constance L. Brine, 695 Huntington Ave., Boston, Mass., Nutritionist, Harvard School of Public Health
- Lois E. Christiansen, Box 174, Cumberland Center, Me., Student, Simmons College

Helen G. Olson, State Dept. of Health, Richmond 19, Va., Nutrition Consultant

*Maternal and Child Health Section*

- Laura N. Baernstein, M.D., 4611 Highland Ave., Bethesda 14, Md., Clinic Physician, Maternal and Child Welfare Clinics, District of Columbia Health Dept.
- C. E. Branner, M.D., Sacajawea Annex, LaGrande, Ore., Gynecologist
- Dr. Werner Bustamante-Espinoza, General del Canto 235, Santiago, Chile, Chief, Maternal and Child Health Section, National Medical Service
- Madelene M. Donnelly, M.D., 930 Church St., Ann Arbor, Mich., Student, Univ. of Michigan
- Mildred M. Dorod, R.N., 1001 Huron Rd., 4th Floor, Cleveland, Ohio, Health Supervisor, Children's Services

*Public Health Education Section*

- Claudius G. Britt, 1102 E. Ann, Ann Arbor, Mich., Student, School of Public Health, Univ. of Michigan
- John W. Brown, M.D., Wisconsin General Hospital, Madison 6, Wis., Professor of Preventive Medicine and Director of Student Health, Univ. of Wisconsin
- G. Clifford Byrd, 209 W. Main, Crisfield, Md., Director, Crisfield Seafoods Laboratory
- Robert C. Clarke, 344 Fulton St., San Francisco 2, Calif., Student, Graduate School of Public Health, Univ. of California
- Watson W. Dersham, M.Ed., 300 Green St., Mifflinburg, Pa., School Cancer Program Advisor, American Cancer Society
- Faye L. Dinwiddie, 1217 Collingwood Blvd., Toledo 2, Ohio, Field Secretary, Toledo Public Health Assn.
- Harold K. Fuller, M.A., 721 Elmwood Ave., Lincoln, Neb., Asst. Director, Division of Public Health Education, State Dept. of Health
- Josie Hazel, 1114 Fairfield St., Aiken, S. C., Field Worker, South Carolina Tuberculosis Committee
- Mary E. Head, M.S., 45 Second St., Room 409, San Francisco, Calif., Consultant to Executive Secretaries, California Tuberculosis and Health Assn.
- Mary E. Mackall, M.S., 3140 Klinge Rd., N.W., Washington 8, D. C., Information Specialist, U. S. Public Health Service
- Thomas J. Magee, 1204 Chapel St., New Haven 11, Conn., Student, Dept. of Public Health, Yale University School of Medicine
- Catherine M. Maloy, N.F.I.P., 120 Broadway, New York 5, N. Y., Professional Public

Relations, National Foundation for Infantile Paralysis

Sebastian J. Sherry, County Office Bldg., Room 324, Pittsburgh 19, Pa., Chief of Social Service, Allegheny County Institution District

Howard E. Wilkening, Ph.D., 1337 Allen Ave., Glendale 1, Calif., Assoc. Professor, Univ. of Southern California

Ada M. Yerwood, M.S., 700 Brazos, Austin, Tex., Field Consultant in Health Education for Negro Program, Texas Tuberculosis Assn.

#### *Public Health Nursing Section*

Mildred E. Cardwell, R.N., R.D. No. 5, Box 593, Lansing, Mich., Supervising Nurse, Ingham County Health Dept.

Mildred L. Chapman, R.N., 421 West 21st St., New York, N. Y., Asst. Supervisor, Community Service Society

Annabel M. Cook, 132 East 45th St., New York 17, N. Y., Public Health Nurse, San Diego City Health Dept.

Susan M. Fortune, 39 Stearns Rd., Ogunquit, Me., Town Nurse, Wells Public Health Assn.

Sister Mary Ethel, 565 Abbott Rd., Mercy Hospital, Buffalo, N. Y., Superintendent of Nurses

Martha E. Nickse, R.N., 9137 218th St., Queens Village, N. Y., Student, New York University

Mildred Shaulis, R.N., 5389 Spokane, Detroit 4, Mich., Staff Nurse, Wayne County Health Dept.

Marjorie W. Spaulding, M.A., Box 949, Raleigh, N. C., Senior Asst. Nurse Officer, U. S. Public Health Service

Evelyn M. Washburn, R.N., 9137 218th St., Queens Village, N. Y., Student, New York University

Sarah R. Wrench, R.N., State Health Dept., State Office Bldg., Richmond, Va., State Advisory Nurse

#### *Epidemiology Section*

Dionyz Blaskovic, M.D., Univ. of Mich., School of Public Health, Ann Arbor, Mich., Chief, Dept. of Microbiology, State Institute of Hygiene, Bratislava, Czechoslovakia

Carlos A. Huergo, M.D., Esmeralda 860, Buenos Aires, Argentina, Director de Epidemiologia, Secretaria de Salud Publica

Aristides C. Limaverde, M.D., Dias da Cruz

342, Rio de Janeiro, Brazil, Health Officer, National Dept. of Health

Dr. Adolfo S. Cianchetta Sivori, Montevideo 751, Buenos Aires, Argentina, Director General de Sanidad de Fronteras y Transportes

Iris H. Wilson, R.N., 102 S.W. 19th Rd., Miami, Fla., Venereal Disease Clinic Supervisor, Dade County Health Dept.

Arthur H. Wolff, D.V.M., 319 Hillcrest Ave., East Lansing, Mich., Director, Salmonella Study, Bureau of Disease Control, State Dept. of Health

#### *School Health Section*

Sarah T. Baker, 25 Wellbrook Ave., Staten Island 3, N. Y., School Nurse Teacher, New York City Dept. of Health

Nora P. Hall, 410 5th Ave., N.E., Puyallup, Wash., Health Coordinator, Public Schools  
L. Velma Seanor, R.N., 106 S. Primrose Ave., Alhambra, Calif., Supervising Nurse, Montebello Unified School District

#### *Dental Health Section*

Myron M. Lieb, D.D.S., 9 Maple Drive, Great Neck, N. Y., Dentist

Paul K. Losch, D.D.S., 300 Longwood Ave., Boston, Mass., Asst. Professor, Harvard School of Dental Medicine

#### *Unaffiliated*

Seymour B. Bigman, D.V.M., 31 Point St., Natick, Mass., Resident-Intern, Natick Animal Hospital

Ultan P. Byrne, M.B., D.P.H., 455 West 13th Ave., Vancouver, B. C., Canada, Director of Clinics, Psychopathic Division, Provincial Mental Hospitals

Steven J. Chorvat, 5236 Dolloff Rd., Cleveland 4, Ohio, Junior Food and Drug Inspector, City Food and Drug Administration

William C. Harrison, M.D., 2126 Upton Ave., North, Minneapolis 11, Minn., Student, School of Public Health, Univ. of Minnesota

Sydney S. Norwick, M.D., M.P.H., Hotel Richelieu, San Francisco 9, Calif., Medical Director, Agricultural Workers Health and Medical Assn.

Martha D. Ring, 3510 Morrison St., Washington 15, D. C., Health Economist, U. S. Public Health Service

Leon Slatko, D.V.M., City Hospital, 605 Columbus, Waco, Tex., Director, Meat and Dairy Inspection, Waco-McLennan County Health Unit



HEALTH OFFICERS SECTION ELECTS  
REPRESENTATIVES TO COMMITTEE ON  
ADMINISTRATIVE PRACTICE

At the 74th Annual Meeting of the American Public Health Association in Cleveland, the Health Officers Section Council elected as members of the Standing Committee on Administrative Practice the following health officers:

Gregoire F. Amyot, M.D., D.P.H., Victoria,  
B. C.  
V. L. Ellicott, M.D., Dr.P.H., Rockville,  
Md.  
L. E. Burney, M.D., M.P.H., Indianapolis,  
Ind.

DECEASED MEMBERS

Porter J. Crawford, M.D., Cuba, Elected  
Member 1926, Elected Fellow 1935, Health  
Officers Section  
Martin Bernfield, M.D., San Antonio, Tex.,  
Elected Member 1940, Health Officers Section  
Frederick E. Bolt, M.D., Worcester, N. Y.,  
Elected Member 1924, Unaffiliated

Frank J. Brands, Brooklyn, N. Y., Elected  
Member 1937, Engineering Section  
Robert L. Crockett, M.D., Oneida, N. Y.,  
Elected Member 1915, Unaffiliated  
Wendell J. Erickson, Albany, N. Y., Elected  
Member 1938, Engineering Section  
Felix E. Fernandez-Garcia, M.D., Habana,  
Cuba, Elected Member 1938, Laboratory  
Section  
William V. Halversen, Ph.D., San Jose, Calif.,  
Elected Member 1940, Laboratory Section  
Dorcas O. Hoge, Grand Island, Neb., Elected  
Member 1935, Laboratory Section  
Clarence H. Mackey, M.D., Lancaster, N. Y.,  
Elected Member 1920, Unaffiliated  
Thomas H. Milford, Montgomery, Ala., Elected  
Member 1943, Engineering Section  
Major Wilbur Craig Mooney, Vancouver,  
B. C., Canada, Elected Member 1945, Epi-  
demiology Section  
Amanda M. Sheeler, R.N., Lansdowne, Pa.,  
Elected Member 1932, Public Health Nurs-  
ing Section  
Bert L. Stinson, M.D., Homer, La., Elected  
Member 1936, Health Officers Section  
Robert G. Townsend, Lincoln, Neb., Elected  
Member 1946, Food and Nutrition Section

## EMPLOYMENT SERVICE

The following pages present information for those seeking qualified public health personnel and for those seeking positions in public health.

This is a service of the Association conducted without expense to the employer or employee.

Address all correspondence to the Employment Service, A.P.H.A., 1790 Broadway, New York 19, N. Y., unless otherwise specified.

### POSITIONS AVAILABLE

(Supplemental to list in January Journal)

**Wanted:** Young public health nurse recently out of school for generalized program in South Carolina city, population 17,500. Position recently established, promotional opportunities. Must own car. Beginning salary \$2,000 plus travel. Write Box N-388, Employment Service, A.P.H.A.

**Wanted:** Qualified public health nurses for staff positions in generalized program in Greenwich, Conn. Salary \$2,040-\$2,520 dependent upon qualifications. Write Town Nursing Service, 116 East Putnam Ave., Greenwich, Conn.

**Wanted:** Competent, well trained, industrial hygienist-sanitary engineer for industrial company. When replying give education and experience. Write Box I-2, Employment Service, A.P.H.A.

**Wanted:** Director for newly organized two-county district, upper Michigan Peninsula. Summer and winter resort area on Lake Michigan. Budget \$52,000, population almost 50,000. Staff of 13 or more. Beginning salary \$6,600 plus \$750 travel allowance. For information, also on possible expansion with increase in responsibility and salary write Russell E. Pleune, M.D., Director, Northern Peninsula Office, Michigan Department of Health, Escanaba, Mich.

**Wanted:** Public health or sanitary engineer with engineering degree to direct environmental sanitation program in county health department in Southwestern Michigan. County is part of the field training area for the Michigan Department of Health. Beginning salary \$3,000 plus travel allowance. Write Box S-1, Employment Service, A.P.H.A.

**Wanted:** Public health nurses for staff positions in generalized public health nursing program in well established county (part of the field training area for Michigan Department of Health). Beginning salary \$2,000-\$2,400 depending on training and experience plus travel.

Write Box N, Employment Service, A.P.H.A.

**Wanted:** Associate bacteriologist in charge of clinical laboratory in eastern state health department. B.S. degree plus three years' experience, thorough foundation in chemistry and background in bacteriology are requisites. New position with teaching duties. At present beginning salary \$3,000, annual increments, increase considered. Write Box L-3, Employment Service, A.P.H.A.

**Wanted:** Health Officers with experience or training in public health for County Health Units as follows: Duval County-Jacksonville; Gadsden County-Quincy; Putnam and Flagler Counties-Palatka. Also Medical Directors for Bureau of Maternal and Child Health and for Division of Industrial Hygiene, with headquarters in Jacksonville. Salaries determined by experience and training. Write State Health Officer, P. O. Box 210, Jacksonville, Fla.

**Wanted:** Health Educators to conduct general community health education programs at local level in Mississippi. Beginning net income \$2,400 per year with periodic increases, plus travel expenses. M.P.H. with major in health education from a recognized school required. Contact Dr. N. C. Knight, Director, Division of Health Education, State Board of Health, Jackson 113, Miss.

**Wanted:** State Vital Statistics Registrar, Male; \$300 to begin; Permanent. Minimum: 3 years' experience in birth and death registrations; college graduate, preferably supplemented by one year graduate work in public health with major in vital statistics. Write or wire A. T. Johnson, Personnel Director, Oregon State Board of Health, 1022 S.W. 11th Avenue, Portland 5, Ore.

**Wanted:** Venereal disease control physician, St. Louis City Health Division. Special training and experience in ve-

nereal diseases; clinical, laboratory, and public health aspects required. Full-time. Civil Service. State qualifications and acceptable salary. Write Department of Personnel, City of St. Louis, Mo., 14th and Market Streets.

**Wanted:** Public health nursing supervisor. Should have B.S. degree, major in Public Health Nursing Supervision and minimum one year supervisory experience in generalized program. Salary \$3,000. Write Director, City-County Health Unit, 28 East Boulder, Colorado Springs, Colo.

**Wanted:** Medical-social worker for challenging position. Combination case work and community organization in Voluntary Health Agency, Denver, Colo. No travel. Write Box M, Employment Service, A.P.H.A.

**Wanted:** Qualified public health nurse with tuberculosis experience for progressive voluntary agency with active community program. West. Write Box N-2, Employment Service, A.P.H.A.

**Wanted:** Laboratory technician or medical secretary technician for clinical laboratory in Massachusetts. Five-and-a-half-day week, no night work. Write Box J, Employment Service, A.P.H.A.

**Wanted:** Medical Director for rural county, population 28,000, Midwest. Budget supplied entirely by county funds. Salary \$5,000 plus travel. One month annual vacation, pension system. Write Box Q, Employment Service, A.P.H.A.

**Wanted:** Staff nurse for generalized service including bedside and school nursing. Salary \$200 to \$240. City-County Health Department. Population 85,000. Seventeen staff nurses, 1 field supervisor, 1 clinic supervisor, 1 nursing director, 6 sanitarians, 1 medical director. Write Box U, Employment Service, A.P.H.A.

**Wanted:** Director of Nurses to supervise nurses and to direct a school for practical nurses in a new hospital. Opportunity to participate in the organization of a new hospital for the care of long-term illnesses, located at Cascade, Washington County, Maryland. Maintenance, health and retirement benefits. Proposed salary subject to approval \$3,000-\$3,750. *Requirements:* B.S. in nursing; one year's study in teaching and supervision of nursing or in hospital administration. One year in teaching and supervision of nursing in school of nursing or hospital plus one year as Director of School of Nursing; or five years as a Nursing Supervisor. Write Dr. J. A. McCallum, Cascade, Washington County, Maryland.

**Wanted:** Communicable Disease Control Physician with major part of work in V.D. Aptitude and interest in clinic services, and program direction preferable to experience which is desirable. Some public health training experience preferred. Fifty-bed contagious disease hospital. Beginning salary \$5,000 per year plus travel. Civil service standards. Give full qualifications first letter. Write Director, City Health Department, Lansing 7, Michigan.

**Wanted:** Director of city health department laboratory and associate professor of bacteriology at university, combined position, Middlewest. Beginning combined salary \$4,000 with yearly increases. Tenure protected by Civil Service, retirement provisions. Write Box F, Employment Service, A.P.H.A.

**Wanted:** Veterinarian in new position, state health department in East. Write Box Y, Employment Service, A.P.H.A.

**Wanted:** County Nutritionist for the Department of Health, Territory of Hawaii. Must have a bachelor's degree in Home Economics with a major in Foods. Some experience in teaching or food clinics is desirable. The position requires talks and demonstrations to clinics and health conferences, other group teaching, individual consultation and family counseling in food and nutrition problems. Ability to prepare visual aid materials is desirable. Starting salary is \$212.92 with a \$25 cost of living adjustment. Write Mrs. Marjorie Abel, Division of Nutrition, Territorial Health Department, Honolulu, T. H.

**Wanted:** Sanitary Engineer with training and experience in public health. County 100 miles from Chicago, 35,000 population. Salary \$315; travel allowance \$50.00 per month. Write Lee Co. Health Department, Dixon, Illinois.

**Wanted:** Bacteriologist-immunologist, Ph.D. for research and developmental work in one of the important companies in pharmaceutical industry. Eastern location. Salary according to experience. Write Box O-2, Employment Service, A.P.H.A.

**Wanted:** Public Health Nurse as Assistant Director in children's Health School. Full responsibility for home investigation and admission of children. Also coöperative responsibility with the Director for administration of the institution. Good opportunity for person interested in health teaching. Salary \$2,000-\$2,400 plus full maintenance. Write Health Hill, 2801 East Boulevard, Cleveland, Ohio.

**Wanted: Public Health Nurses** in official generalized program of Washtenaw County, Michigan, at Ann Arbor. Cultural and recreational advantages of University town. Agency is field teaching center for University of Michigan. Opportunity to study at University. Write for details to Nursing Director, 720 E. Catherine Street, Ann Arbor, Mich.

**Wanted: Public Health Nurses** for staff positions in a progressive automobile city in Michigan. Population 150,000. Beginning salary \$210. Annual increases. Merit and retirement systems. Program includes generalized field service, school

nursing, interviewing in clinics and group work. Minimum requirement certificate in Public Health Nursing. Write Director, Public Health Nursing, Department of Health, Box 28, Flint, Mich.

**Wanted: Public Health Nurses.** Generalized service, supervision, staff of 8. Public health nursing course, experience desired. Salary \$2,100-\$2,700 depending on professional background and experience, car allowance \$60 per month. Health department in commuting distance from Chicago, Ill. Apply: Dr. James W. Chapman, Director, DuPage County Health Department, 52 E. St. Charles Road, Villa Park, Illinois.

### POSITIONS WANTED

**Bacteriologist, M.S.,** minor chemistry, 8 years of experience in industrial, sanitary, and clinical bacteriology desires responsible position in public health, clinical or industrial laboratory or teaching institution. Write Box L-505, Employment Service, A.P.H.A.

**Parasitologist, M.S., Ph.D.** Experience: College teaching 8 years; U. S. Army parasitologist and tropical malaria control 4 years, laboratory director 1 year. Write Box M-470, Employment Service, A.P.H.A.

**Nutritionist, M.S. (nutrition).** Experience: State Health Dept. 1½ years, federal agency 1½ years, hospital dietitian 5 years. Write Box N-400, Employment Service, A.P.H.A.

**Public Health Editor** and information specialist, woman, considerable experience in preparation of health articles, pamphlets, radio, and newspaper work, public relations, desires position East or Midwest. Write Box M-478, Employment Service, A.P.H.A.

**Biologist, three (3) years'** experience as insect and rodent control officer at large permanent Army post; six (6) years' teaching experience, B.S. and M.S. degrees in biology and zoology; recent Capt., Sanitary Corps A.U.S.; present

salary \$4,100 per year; seeks position as pest control engineer or biology instructor. Write Box E-500, Employment Service, A.P.H.A.

**Bacteriologist - Immunologist, Ph.D.** Major interest sanitary, including air, and food bacteriology. Experience as head health department division and university research program. Numerous publications. Age 38. Write Box L-502, Employment Service, A.P.H.A.

**Health Educator, female, age 37, Negro,** with three years' experience in Health Education, twelve years' experience in social work and community organization; capable of working with entire community; considerable experience working with racial and religious minorities. Write Box H-522, Employment Service, A.P.H.A.

**Writer, experienced, college graduate,** woman, general medical background, several scientific translations from German. Four years' research for official agency on history of state hospitals. Also experienced in organizing social service for physically handicapped. Desires position in editorial work, library research, translation, and administrative personnel work. Write Box H-526, Employment Service, A.P.H.A.

### Fellowships in Medical Research

Dr. Thomas Parran, Surgeon General of the U. S. Public Health Service, announces approximately 120 one year fellowships in medical research open to men and women who are graduate science students.

The National Cancer Institute, a division of the National Institute of Health, has funds to train approximately 30 physicians in the diagnosis and treatment of cancer. Doctors wishing to specialize in this field may be appointed as trainees and be assigned to authorized institutions.

The National Institute of Health offers research fellowships to graduates of accredited colleges who have majored in biology, chemistry, dentistry, entomology, medicine, physics, and other scientific fields. Senior research fellowships are awarded at a yearly stipend of \$3,000 to those who hold a Ph.D. degree in one of the specified scientific subjects. Junior fellows receive \$2,400 annually and must hold an M.S. degree or have completed the equivalent of such a degree in post-graduate study. Fellowships may be renewed for a second year. Applications for fellowships and traineeships should be sent to the Director, National Institute of Health, Bethesda, Md.

The U. S. Public Health Service also administers fellowships for health personnel from other American republics and the Philippine Islands. Applications for these fellowships should be sent to The Surgeon General, U. S. Public Health Service, Washington 25, D. C.

### Fellowships for the Training of Health Educators

The U. S. Public Health Service announces that fellowships leading to a Master's degree in Public Health in the field of health education are again being offered. Candidates must be U. S. citizens between 22 and 40 years of age, must hold a bachelor's degree from a recognized college or university, and must be able to meet the entrance requirements of the accredited school of public health of their choice.

In addition to the degree, courses in the biological sciences, sociology and education may be required. Training in public speaking, journalism, psychology, and work in public health or a related field are considered desirable qualifications.

Tuition, travel expenses for field training and a monthly stipend of \$100 will be

provided out of funds furnished by the National Foundation for Infantile Paralysis. The year's training which begins with the 1947 fall term, consists of 8 or 9 months of academic work and 3 months of supervised field experience.

Veterans are encouraged to apply and will be paid the difference between the allowance under the G.I. Bill of Rights and the monthly stipend of \$100. Employees of local and state health departments are not eligible since Federal grants-in-aid are already available for such training purposes.

Application blanks may be obtained by writing the Surgeon General, United States Public Health Service, Washington 25, D. C., and must be filed prior to March 15, 1947.

### Exchange of Public Health Personnel between Hawaii and the Mainland

An opportunity for public health nurses, sanitary and medical officers to work in the Hawaii Health Department is now offered under the new exchange personnel program inaugurated by the Board of Health in the Territory.

As passed by the Hawaii legislature, the enabling act calls for an exchange of personnel for a period not to exceed a year.

Provisions in the act state that each person exchanged by the health department of any state must possess qualifications equal to the qualifications of the person exchanged for him from Hawaii and must hold in the state health department a position which is equivalent to the position held by the person exchanged for him in Hawaii.

Salaries for both exchanging parties will be paid by the home employer. Travel, board, lodging or other such expenses will not be paid by the Territorial Health Department.

Eligible persons employed on the mainland who desire to take advantage of this exchange program are requested to write Dr. Richard K. C. Lee, Assistant Health Executive of the Board of Health, Territory of Hawaii.

### Fellowships for Physicians and Engineers

The Surgeon General announces that applications for Fellowships in post-graduate public health training for physicians and engineers, for the school year beginning in the fall of 1947, will be received prior to May 1, 1947. The Fellowships are made possible through a grant given by the National Foundation for Infantile Paralysis.

The Fellowships include nine months of training in an accredited school of public health or an acceptable school of sanitary engineering followed by three months of field training.

Requirements: Under 45 years of age, United States citizenship. Physicians must have completed at least one year's internship. Engineers must have a bachelor's or higher degree in sanitary, civil, or chemical engineering, or another engineering degree with experience in public health or sanitary engineering.

The Fellowships are intended for newcomers to the public health field and are not open to employees of state or local health departments for whom federal grant-in-aid funds are already available to the states. The purpose of the Fellowships is to aid in the recruitment of medical and engineering personnel to help fill hundreds of vacancies existing in state and local health departments throughout the country.

The Fellowships are administered by the Surgeon General's Committee on Training of Public Health Personnel. Applicants may secure further details by writing to The Surgeon General, U. S. Public Health Service, 19th and Constitution Ave., N.W., Washington 25, D. C.

### **Examinations for Scientists for Appointment to the Regular Corps of the U. S. Public Health Service**

Seventy-five vacancies exist in grades of Assistant and Senior Assistant Scientist in the Regular Corps of the U. S. Public Health Service. Written examinations will be held April 14 and 15, oral examinations during the period February 13 to April 9 in thirty cities strategically located throughout the United States.

Commissions are available to scientists trained in any of the following fields: bacteriology, mycology, parasitology, entomology, malacology, biology, chemistry, physiology, physics, statistics (mathematical, demographic, etc.), psychology, and for milk and food specialists.

Requirements: (1) Assistant Scientist:

United States citizenship, 7 years of educational and professional training or experience, certificate or diploma from institution of recognized standing and satisfactory health, as established by physical examination. (2) Senior Assistant Scientist: As for Assistant Scientist, plus four years of additional training or experience.

Remuneration: (1) Assistant Scientist: Annual pay with allowances for dependents, \$3,811. (2) Senior Assistant Scientist: Annual pay with allowances for dependents, \$4,351. For both grades full medical care, hospitalization for appointees and families, including disability retirement, thirty days' annual leave. Periodic promotions. Retirement age: 64.

Application forms and additional information may be obtained from the Surgeon General, U. S. Public Health Service, Washington 25, D. C.

### **U. S. Public Health Service Announces Examinations for Nurses**

Examinations for the appointment of registered nurses to the U. S. Public Health Service will be given during March and April, 1947, in cities throughout the nation, according to an announcement made by Miss Lucile Petry, Chief of the Division of Nursing.

"The Public Health Service offers opportunities for recent graduates as well as experienced nurses," Miss Petry said.

"For the new registered nurse who can qualify here is an opportunity to acquire good initial experience. The Public Health Service offers the experienced nurse a permanent career with the advantages of professionally stimulating work, job security, regular salary increases, and opportunities for advanced study and promotion on the basis of training and ability."

Nurses interested in obtaining further details concerning appointment to the U. S. Public Health Service should write to Miss Lucile Petry, Chief, Division of Nursing, U. S. Public Health Service, Washington 25, D. C. Specific dates for examinations will be announced shortly.

## *Advertisement*

# **Opportunities Available**

**WANTED**—(a) Assistant professor of public health nursing; duties include serving as educational director of city public health service and supervising students for field experience in public health nursing; degree required, Master's preferred; salary dependent upon qualifications; West. (b) Director of health education; degree in health education or public health nursing required; advantageous if experienced in community health organization, including tuberculosis con-

trol; duties entail clinic service in diagnostic chest clinics and developing health education program; East. (c) Public health nurse to become associated with Division of Cancer Control; considerable traveling throughout state; unusual opportunity. (d) Associate for nursing division, national health agency; administrative ability and experience required; headquarters in New York City. (e) Nurse consultant; duties consist of being responsible principally for education

in tuberculosis and heart disorders of student nurses, in-service programs with school, industrial and bedside nurses, some industrial work; California. (f) Public health nursing supervisor; city department of health; New England; \$3,660. **PH2-1** The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago 11.

**WANTED**—(a) Nutrition consultant qualified to conduct state-wide educational program; \$260-\$300; West. (b) Nutritionist to direct district staff of nutritionists; Master's degree and experience in public health desirable; municipal department of health; \$345; West. **PH2-2** The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago 11.

**WANTED**—(a) Director of health, public school system; enrollment of 20,000; 800 employees; staff of 12 nurses, two dentists, several oral hygienists; preference for physician who has specialized in pediatrics or public health; immediately. (b) Director of division of venereal disease; must be qualified not only in diagnosis and treatment of venereal disease but familiar with direction of general control program; population of county, two million; Middle West; \$7,000 plus traveling expenses. (c) Physician trained and experienced in infant care to direct maternal and child health services, municipal department of health; newly created position unimpeded by politics; woman eligible; \$5,000-\$6,000 with provision for salary advancements to \$9,900; large city in Middle West. (d) Young physician for position of director of health and physical education; public school department of health; staff of 12 nurses, 2 dentists, and approximately 40 physical educational instructors; enrollment of 17,000 students; faculty of 6,000; town of 75,000 located short distances from several large cities including university medical center. (e) Assistant director, student health department, coeducational college; well

equipped 100 bed hospital; town of 18,000 located short distances from several large cities; \$4,500 plus opportunity of private practice; Southwest. (f) Assistant directors for following departments: Adult Hygiene, Administration, Venereal Disease; physicians with Master's degree in public health or minimum three years' public health experience; East. **PH2-3** The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago 11.

**WANTED**—(a) Health educator to take charge of state-wide program, division of one of the national organizations; South; \$4,000 including travel expenses; man preferred. (b) Research statistician experienced in cancer statistics or biological research; unusual opportunity with new institution specializing in cancer research; man preferred; woman eligible. (c) Public relations director, large hospital in the Middle West; preferably someone with minimum ten years' experience in the public relations-financial campaign field; permanent association; \$10,000. (d) Sanitary engineer; state department of health which is being reorganized; salary for recent graduate, \$250; salary for experienced candidate, \$350. (e) Health educator; duties consist of working throughout eastern state with headquarters in capital; degree in public health education required; five years' experience desirable; \$4,000. (f) Sanitary engineer; duties consist of serving in advisory capacity in general overall sanitary and anti-malarial work of large industrial company; preferably someone free to travel. **PH2-4** The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago 11.

**WANTED**—(a) Dentist to join staff of department of health, public school system; Middle Western town of 100,000; full-time, permanent; \$4,500. (b) Dentist preferably qualified in public health dentistry for directorship of dental health in southern state; immediately. **PH2-5** The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago 11.

## Advertisement

# Opportunities Wanted

Health educator; Bachelor of Education degree; graduate courses in sanitation; eight years, supervisor of physical education in public schools; three years, sanitarian; past three years, health educator, municipal department of health; for further details, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Medical editor; B.S. degree; Public Health certificate; several years, public health work; past four years, engaged in medical journalism; for further details, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Nutritionist; B.S. in home economics, M.S. in nutrition; year's fellowship in nutrition during which time she completed vitamin assay of foods; several years on faculty of department of nutrition of university school of home economics; is particularly interested in abstracting nutrition studies or collaborating research findings and nutrition advertising; for further details, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Parasitologist—M.A. (Bacteriology), Ph.D. (Bacteriology and Parasitology); several years science teacher in the public schools; three years assistant in department of pathology, university medical school; six years assistant professor, directing own work in parasitology; for further details, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Public health nurse is available for administrative position in public health; Bachelor of Science in Education with major in Public Health Nursing; past several years, supervisor public health staff, important war project; for further details, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Public Health physician is available; Master's degree in Public Health, Johns Hopkins; twelve years' experience as professor of preventive medicine, public health and industrial medicine, university medical school; for further details, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

## NEWS FROM THE FIELD

### RESEARCH PLANS ANNOUNCED BY U. S. PUBLIC HEALTH SERVICE

Recent announcements by the U. S. Public Health Service indicate expanded research facilities in several areas, three of which are summarized below.

#### *Coöperative Nuclear Research Program*

A nuclear research program will be undertaken at the Clinton Laboratories in Oak Ridge, Tenn. This will be a coöperative venture between a newly created Biological Research Division of the Monsanto Chemical Company, which operates the Clinton Laboratories, and the National Institute of Health. The program will include extensive research into the effect of nuclear radiations upon living cells and to determine the maximum safe exposure for workers in this field. The practical use of atomic energy in industry is dependent upon the solution of problems of maximum safe exposure for workers.

The undertaking will further permit the National Institute to take advantage of new tools being made available at the Clinton Laboratories in its research on such subjects as infectious diseases, nutrition, tropical disease, malignancy, and fundamental studies in biochemistry and physiology.

The program will be in charge jointly of Dr. Alexander Hollaender, Principal Biophysicist of the National Institute, and Dr. Eugene P. Wigner, Research Director of the Clinton Laboratories.

#### *To Study Effectiveness of BCG Vaccine*

Following upon reports presented at a recent conference of tuberculosis leaders of the United States, China, and Denmark, the U. S. Public Health Service announced an extension of its tuberculosis research program to include

studies on the effectiveness of BCG vaccine in preventing the disease.

Studies presented at the conference indicate that BCG vaccination confers increased resistance for the limited period covered in these studies, but is not 100 per cent effective. There have been no proved cases of progressive disease resulting from BCG vaccination and it can be used without causing severe local reactions. Although the conference emphasized that BCG vaccine should not yet be made commercially available in the United States, it strongly advocated extensive research to determine the efficiency of the vaccination. It was also recommended that methods be developed to standardize techniques of preparation of a potent and stable vaccine for use in the United States and if possible throughout the world.

Plans proposed for carrying on this research include: establishment of a laboratory to produce BCG vaccine for use in research programs throughout the country; extensive investigations carried on coöperatively by recognized research groups, especially in populations highly exposed to tuberculosis; a controlled study by the Tuberculosis Control Division of the Service in a community of 100,000 or more persons to determine immediate and long-range results; development of standardized techniques of preparation of a potent and stable vaccine.

#### *Memorial Laboratory Dedicated at National Institute of Health*

On October 27, 1946, the Memorial Laboratory for the study of infectious diseases was dedicated as the 8th building of the National Institute of Health, Bethesda, Md., according to an an-



nouncement by the Federal Security Agency. The laboratory is a memorial to the 23 members of the U. S. Public Health Service who have died in line of duty; from Dr. Roswell Waldo who died from yellow fever in 1878 to three who were fatally infected in 1944, Dr. Richard G. Henderson and Scientific Aide Philip Leroy Jones with scrub typhus, and bacteriologist Rose H. Parrott with tularemia.

The laboratory will be administered by Dr. Charles Armstrong, Chief of the Division of Infectious Diseases of the Institute. It will be the scene of intensive research on the Rickettsial diseases, undulant fever, tularemia, psittacosis, poliomyelitis and other central nervous system viruses, and the common cold. Many of the unique preventive facilities of the laboratory have been developed as a result of Dr. Armstrong's experiences, who has himself several times been the victim of disease in the course of his research.

#### LOUISIANA EXPERIMENT IN BIRTH REGISTRATION

A new system of birth registration has been inaugurated in Louisiana. Ten parishes will test the effect of parent participation on the accuracy and completeness of birth registration. Should the experiment result in an improvement in registration, the legal responsibility for registering births will be transferred from the attendant to the parent. Parents will review and sign the child's certificate. The attending physician is to notify the local health unit of the occurrence of a birth within 48 hours after birth. Hospitals are urged to cooperate, as they have in the past, to the extent of preparing the certificate for the mother and making sure she reviews it carefully and signs it before leaving the hospital. The project will test the system for two years as a coöperative experiment between the Division of Public Health Statistics of the State

Department of Health and the U. S. Bureau of the Census. At the end of this period, if considered feasible, legislative revision will be sought to relieve the attending physician of his responsibility in birth registration and to place this responsibility on the parent. The Louisiana State Medical Society has approved the project. Similar innovations are under way in other states and if successful may be adopted on a national scale.

#### HEALTHFUL LIVING IN FILMS

The McGraw-Hill Book Company (330 West 42nd Street, New York 18) announces a new technique in health education. It will use specially prepared films for supplementing Dr. Harold S. Diehl's *Textbook of Healthful Living*. This popular textbook for college freshmen hygiene courses and adult education groups is by the University of Minnesota's Dean of the Medical Sciences.

McGraw-Hill has started production of a series of seven 16mm sound motion pictures and a like number of coöordinated silent film strips on vital health subjects. These "Text-Films" will be ready for distribution early in 1947. Instructors' Manuals with suggestions for effective integrated use of films and textbooks will also be provided. Subjects of the seven films are: Body Care and Grooming; Personal Health; Care of the Ears, Nose, and Throat; Group and Public Health; Immunization and Vaccination; Sex Education; and Mental Hygiene.

The Manager of the Text-Film Department of McGraw-Hill is Albert J. Rosenberg who has had wide experience in film work and in education at Johns Hopkins University, the University of Baltimore, and the U. S. Office of Education. Technical assistance will be given by Dr. Diehl and three other members of the University of Minnesota faculty; Dr. William A. O'Brien,

Director of Post-Graduate Medical Education; Dr. Ruth Boynton, Director of Students' Health Service; and Dr. Ruth E. Grout, Professor of Public Health and Education.

#### DIVISION OF SANITARY ENGINEERING IN SOUTH CAROLINA

The Division of Sanitary Engineering in the South Carolina State Board of Health was created on July 1, 1946, making a total of 15 divisions in the department. The Director of the Division is J. H. Stephens, who received his Master's degree in Sanitary Engineering from the Harvard School of Engineering in 1938. He has had twelve years' experience with the South Carolina State Department of Health as well as a year's experience as regional sanitation consultant with the U. S. Public Health Service.

The new division personnel includes, besides Mr. Stephens, three district sanitary engineers supervising the 46 counties of the state, two senior and one junior sanitary engineer, and three principal sanitarians.

#### DIVISION OF DENTAL HEALTH IN MASSACHUSETTS

On July 1, 1946, the General Court of Massachusetts provided funds for the establishment of a Division of Dental Health in the State Department of Health. This followed upon the combined efforts of the department, the Massachusetts Dental Society, and other agencies. Plans are under way to formulate a comprehensive program of dental care, research, dental health education, and community coöperation. First attention will be concentrated upon the dental health of the child.

#### DIVISION OF HOSPITAL AND INSTITUTIONAL SERVICES IN INDIANA

Martha O'Malley, M.D., Dr.P.H., has been appointed Director of the newly created Division of Hospital and Insti-

tutional Care in the Indiana State Department of Health. The new division will work closely with the Advisory Hospital and Health Center Planning Committee named by Governor Gates, and will provide consultant service to hospitals.

Dr. O'Malley is a graduate of the Iowa State University Medical College, received the Master's and Doctor's degrees in Public Health in the Harvard School of Public Health, spent six years in the Bureau of Maternal and Child Health of the Connecticut Health Department, and shorter periods as Research Assistant in the Department of Preventive Medicine and Public Health of the Cornell University Medical School, and in the Harvard School of Public Health.

#### NEW YORK CITY DOGS TO BE VACCINATED

Because of the rapid increase of rabies in the city, the New York City Board of Health will require by law the vaccination of all dogs. During 1946 more than 100 rabid dogs have been picked up in the city and nearly that many persons have been bitten and compelled to take the long course of antirabic inoculations. Three of the Boroughs of the city already were under dog quarantine. It has been decided that no free clinics will be set up by the city to provide this vaccination service.

#### CHEST X-RAYS FOR UNITED NATIONS SECRETARIAT

In December, 1946, the New York City Health Department provided free chest x-rays for the 2,400 employees of the United Nations at Lake Success, N. Y. The U. S. Public Health Service furnished the equipment and some of the technicians.

Persons in charge of handling and assigning UN personnel indicated that the x-ray survey would be especially useful because a number of the Lake

Success workers would shortly be assigned to work in Europe and other points throughout the world.

#### SCHOOL OF MEDICINE AT UNIVERSITY OF WASHINGTON

With the current academic year, the School of Medicine of the University of Washington in Seattle opened with 50 students. This is the beginning of a projected Division of Health Sciences of the university which will include a medical, dental, and nursing school, and a medical center including a 400 bed University Teaching Hospital. In 1945, the Washington State Legislature appropriated an initial \$3,750,000 for the project which it is estimated will involve a total investment of from twelve to fifteen million dollars. Department heads have been appointed and teaching staffs have been organized and equipped for the basic medical science divisions.

#### NON-IMMIGRANT ENTRY AUTHORIZED FOR DOCTORS

The Bureau of Immigration and Naturalization in Washington has authorized the entry into Puerto Rico as non-immigrants of doctors who are not citizens of the United States. The decision applies only to medical personnel who will fill vacancies in the Puerto Rico Department of Health for which qualified Puerto Rican personnel are not available.

#### NEW YORK PRACTICAL NURSE LAW CHALLENGED

The New York State Board of Regents has recommended the repeal of the law licensing practical nurses. Because of "grave concern" over this prospect, the New York State Nurses Association, through its President, Clare M. Casey, has sent the following telegram to each member of the Board of Regents:

The Board of Directors of the New York State Nurses Association deplores the action

of the Board of Regents in recommending a repeal of the law licensing practical nurses.

We believe that this removes the legal safeguard that assures reliable nursing care to your sick.

Joining with Miss Casey in her organization's protest is Practical Nurses of New York, Inc., the association of practical nurses in the state. There are 64,000 registered professional nurses in New York State and approximately 20,000 licensed practical nurses.

The law licensing practical nurses was passed in 1938. Under this law hospitals have until July 1, 1947, to staff their hospitals with registered professional or licensed practical nurses for all those engaged in nursing care of the sick.

#### GENERAL MORRISON C. STAYER HONORED

The War Department has announced the award of an Oak-leaf Cluster to the Distinguished Service Medal of Major General Morrison C. Stayer (Ret.), F.A.P.H.A. The citation reads in part:

Charged with safeguarding the health and lives of American troops on the battle fields of Italy and Southern France, and in areas notorious for the prevalence of malignant and exotic diseases, General Stayer as Theater Surgeon, prompted the Medical Services under his control to achieve a record which is generally regarded as a superior standard of efficiency.

General Stayer was Surgeon of the Mediterranean Theater of Operations during the period referred to.

#### DR. THOMPSON RETIRES

Louis Ryers Thompson, M.D., organizer and former director of the National Institute of Health, concluded 36 years of work with the U. S. Public Health Service on November 1, 1946. A native of Lafayette, Ind., and a graduate of the Louisville Medical College, Dr. Thompson joined the Public Health Service as an Assistant Surgeon in 1910, and since that time has held all ranks in the service, rising to the position of

Assistant Surgeon General in 1930. At the time of his retirement he was Chief of the Bureau of State Services.

Among the most notable of Dr. Thompson's achievements was the organization of the National Institute of Health, of which he was Director from 1937 to 1942. Dr. Thompson has been succeeded by Herman E. Hilleboe, M.D., Chief of the Tuberculosis Control Division since it was organized in 1944. He in turn is succeeded by Senior Surgeon Francis J. Weber, formerly Assistant Chief of the Tuberculosis Control Division.

#### BURT R. RICKARDS RETIRES

Burt R. Rickards retired as of January 1 as Director of the Division of Health Education of the New York State Department of Health, Albany, having served the department as director of the division for 24 years and having spent nearly thirty years in state service. A special occasion with a dinner December 19 recognized his retirement with a special issue of *New York State News* of which Mr. Rickards has been editor for many years.

After a long career of association with Massachusetts Institute of Technology, the *American Journal of Public Hygiene*, of which he was editor and managing editor, retiring in 1912, with the Massachusetts Association of Boards of Health, with the Ohio State Department of Health and other agencies, Mr. Rickards has announced that he will continue an interest in public health as consultant in the field of health education and public relations.

#### NEW FOUNDATION FOR THE STUDY OF BLOOD PRESSURE ANNOUNCED

The public press late in December carried an announcement of the establishment of the American Foundation of High Blood Pressure with headquarters in Cleveland, Ohio. The program as announced will include the financing of

medical research to discover the cause and cure of various circulatory disorders. Donald E. Hagaman, Executive of the Greater Cleveland Chapter of the American Red Cross, was to assume the executive secretaryship of the Foundation in mid-February. Alva Bradley is the Chairman and it was announced that funds will be raised at the national level to advance the study of high blood pressure and arteriosclerosis. Funds for the first three years of the program are said already to be in hand.

#### INTERNATIONAL UNION FOR COMBATING VENEREAL DISEASES

At its first post-war meeting in Paris, November 12 to 14, the Executive Board of the International Union for Combating Venereal Diseases elected William F. Snow, M.D., New York, as its president. Dr. Snow is Chairman of the Board of Directors of the American Social Hygiene Association and of its Committee on International Activities. He spent five weeks in Europe, among other engagements visiting Belgium, Switzerland, and Germany at the request of the Joint Chiefs of Staff. The International Union meeting, attended by 50 persons representing 19 countries of Europe and the Americas, made plans for close coöperation with the new World Health Organization and other United Nations organizations.

Headquarters of the Union are at the Institut Alfred Fournier, 25, Boulevard St. Jacques, Paris XIV. Its Secretary General is André Cavaillon, M.D., of France.

#### ASSOCIATED MEDICAL CARE PLANS

The Associated Medical Care Plans was recently incorporated under the Illinois laws as a coördinating agency for prepaid medical care plans. It will include all state and local nonprofit medical care plans that comply with the minimum standards for Medical Service approved by the Council on

Medical Service of the American Medical Association. The newly appointed director, Frank E. Smith, Ph.D., will have his headquarters with the American Medical Association, 535 N. Dearborn St., Chicago, Ill. Previous to his appointment, Dr. Smith was for two years Director of Public and Professional Relations in the Los Angeles office of the California Physicians Service.

#### INSTITUTES IN HOSPITAL ADMINISTRATION

The American Hospital Association announces a series of about 30 institutes in various parts of the country, covering many topics such as medical records, accounting procedures, purchasing, cost analysis, personnel practices, work of nurse anesthetists, dietetics, etc. The calendar of institutes now planned follows:

Feb. 10-14 Purchasing, Drake Hotel, Chicago, Ill.

Mar. 17-21 Medical Record Librarians, Benjamin Franklin Hotel, Philadelphia, Pa. (with the American Association of Medical Record Librarians)

Mar. 24-28 Accounting Executives, United Hospital Fund, New York, N. Y.

Apr. 14-18 Basic Accounting and Business Office Procedures, Chicago, Ill.

May 26-30 Nurse Anesthetists, New Orleans, La. (with American Association of Nurse Anesthetists)

June 9-13 Medical Record Librarians, Denver, Colo. (with American Association of Medical Record Librarians)

Plans are partially completed for two institutes for dietitians in June and for three or four for personnel officers. Others will be announced at later dates. Further information may be secured from the American Hospital Association, 18 East Division Street, Chicago 10, Ill.

#### VETERINARY PUBLIC HEALTH SECTION OF U. S. PUBLIC HEALTH SERVICE

A Veterinary Public Health Section has been established in the States Relations Division of the U. S. Public Health

Service to conduct demonstration projects on the control of animal diseases communicable to man. This section also will collect epidemiological data pertinent to these diseases. Heading the new program is James H. Steele, D.V.M., M.P.H. Dr. Steele will be responsible for developing the demonstration projects and for consultant services to states in conducting veterinary public health programs. Dr. Steele and his staff will act as consultants to the District Offices of the Public Health Service and will provide special services to state and local health departments at the request of the District Offices.

#### COÖPERATION IN TRAINING PUBLIC HEALTH NURSES

In Cattaraugus County (N. Y.) the County Health Department and the County Tuberculosis and Health Association are coöperating to train public health nurses. The Health Department will accept four young nurses for a year's training in public health nursing under approved supervision at a salary of \$1,800 plus transportation.

Upon completion of this apprenticeship, the County Tuberculosis Association is prepared to give at least two scholarships for a period of academic study in a curriculum approved by the N.O.P.H.N. The tuition would be paid directly to the university and a monthly allowance of perhaps \$100 made to the student.

At the completion of training students will not be required to return to Cattaraugus County although that is the hope of the coöperating agencies.

Applicants who are high school graduates, have graduated from an approved nurse training school, and are eligible for registration in New York State may apply for this training to: Miss Ida McRoberts, Director of Public Health Nursing, 302 Laurens Street, Olean, N. Y.

# 1946 NURSING SCHOOL ADMISSIONS BELOW 1936 LEVEL

Nearly 31,000 new students were admitted to 1,271 state accredited schools of nursing in 1946, according to a report recently issued by the Department of Studies of the National League of Nursing Education. This number is about 700 fewer than the number of students registered in 1936 and less than half of those admitted in 1944. The five years between 1936 and 1941 registered an annual increase of from 1,000 to 2,000 new students, until in 1940 there were more than 38,000.

War inspired patriotism and government scholarships were responsible for swelling enrollments during the war years, the number reaching more than 67,000 in 1944. A drop of nearly a fourth in 1945 and another of nearly a half in 1946 indicates a continuing nurse shortage. The report states that nursing and hospital officials, though expecting the inevitable post-war drop, had counted on a quota of 40,000 enrollments in 1946, approximately 10,000 more than were registered. Every state except Mississippi registered a substantial drop in 1946; in 21 states, 1946 admissions were less than half those of 1945.

# FACULTY CHANGES AT HARVARD SCHOOL OF PUBLIC HEALTH

Among the recent faculty changes at the Harvard School of Public Health in Boston are the following as listed by the Harvard Public Health *Alumni Bulletin*:

Professor John E. Gordon has returned from Army service as Chief of the Preventive Medicine Service in the European Theater and is now Head of the Department of Epidemiology.

Professor Gordon M. Fair, Head of the Department of Sanitary Engineering, has been made also Dean of the Graduate School of Engineering.

Dr. Harold C. Stuart, Head of the

Department of Maternal and Child Health, has been promoted to the rank of full professor.

Dr. Hugo Muench, formerly Fellowship Advisor with the International Health Division of The Rockefeller Foundation, has been added to the staff as the new Professor and Head of the Department of Biostatistics. He has also been appointed Assistant Dean.

Dr. Hugh R. Leavell, formerly Assistant Director, Division for the Medical Sciences of The Rockefeller Foundation, has been appointed Professor of Public Health Practice and Head of the department.

Dr. John C. Snyder, formerly Lieutenant Colonel in the Medical Corps of the Army and member of the staff of the International Health Division of The Rockefeller Foundation, has been made Professor of Public Health Bacteriology and will have charge of the newly established Department of Public Health Bacteriology.

Other appointments and promotions include:

Dr. Shih L. Chang, to the grade of Assistant Professor of Sanitary Biology; Mrs. Bertha S. Burke and Dr. Samuel B. Kirkwood, as Assistant Professors in the Department of Maternal and Child Health, and Dr. Stuart S. Stevenson, as Associate in that department; Dr. David M. Hegsted, as Assistant Professor of Nutrition; Dr. Marshall Clinton, Jr., as Associate in Industrial Hygiene, and Dr. James L. Whittenberger, as Associate in Physiology.

# ULSTER COUNTY (N. Y.) ORGANIZES FULL-TIME COUNTY DEPARTMENT OF HEALTH

The newly appointed Board of Health of Ulster County, New York, with headquarters in Kingston, has organized a staff which began operations on January 1, 1947. Ulster is the third county in New York State to take advantage of the new legislation offering up to 75 per

October 16, 1946. Dr. Garry has been Director of the Tuberculosis Division of the Ohio State Department of Health since 1945. He will be in charge of Tuberculosis Control and Treatment in the Institutions and will also be responsible for organizing the Medical Program of the institutions in the division.

DONALD M. HARRIS, M.D.,\* has resigned as Director of Health District 4, with headquarters in Sioux City, Ia., to accept a similar position of the Chippewa County Health Unit at Sault St. Marie, Mich. District 4 includes the counties of Woodbury, Plymouth, Monona, Crawford, and Ida.

ALBERT MILZER, PH.D.,† formerly Research Virologist of the Samuel Deutsch Serum Center, Chicago, has been appointed Director of the Department of Bacteriology, Michael Reese Hospital, Chicago, Ill.

ARTHUR W. NEWITT, M.D.,\* Senior Surgeon, U. S. Public Health Service, has been elected to the new office of Tuberculosis Control Officer of Chicago, Ill. He will be on leave from the service only long enough to establish this office. Dr. Newitt has been in the Public Health Service as Tuberculosis Control Consultant since 1931 and in the last 2 years has made control surveys in Chicago, Cook County, and New York City.

#### CHANGES IN HEALTH PERSONNEL IN OHIO:

ARCHELAUS D. HARVEY, M.D., Lebanon, has been appointed for a 2 year term as Health Commissioner of Warren County.

FORDER F. DEMUTH, M.D., Hicksville, has resigned as Defiance County Health Commissioner.

JOHN A. LOUIS,† Columbus, has been appointed Executive Secretary of the Ohio Tuberculosis and Health Association.

WILLIAM M. SMITH, M.D., M.P.H.,\* Bismarck, N. D., has resigned as Acting State Health Officer of North Dakota.

WILLIAM B. WILD, M.D.,† Mansfield, Ohio, has been named Director of the Barry County, Mo., Health Department filling the vacancy that occurred when JOHN K. ALTLAND, M.D.,† resigned to become Director of Local Health Services of the Michigan State Department of Health, Lansing.

#### Eastern States

REGINALD M. ARCHIBALD, M.D., Associate at the Rockefeller Institute for Medical Research, New York, and special investigator at the hospital, has been appointed Professor of Biochemistry at the Johns Hopkins University School of Hygiene and Public Health, Baltimore, Md., filling the vacancy created by the retirement of ELMER V. MCCOLLUM, Sc.D.† Dr. Archibald will place primary emphasis on biochemistry as related to human nutrition, both in the laboratory and in actual practice.

GEORGE BAEHR, M.D.,\* was elected a member of the Board of Directors of the Milbank Memorial Fund in December. The Fund was organized in 1905 to "promote the welfare of mankind" and is currently carrying on a program of research in various fields of public health. Dr. Baehr is President of the New York Academy of Medicine and serves on the directorship of many community and national health agencies, among them the National Health Council, the New York State Public Health Council, and the Health Insurance Plan of Greater New York. He is Chairman of the Lasker Award Committee of the American Public Health Association. He saw service in both World Wars. In the late war, he was first

\* Fellow A.P.H.A.

† Member A.P.H.A.

Chief Medical Officer of the Office of Civilian Defense and later Medical Director of the U. S. Public Health Service.

FRANK A. CALDERONE, M.D.,\* has been appointed Director of the Headquarters office of the Interim Commission of the World Health Organization, located in the Empire State Building, New York City. During the past ten years Dr. Calderone has been on the staff of the New York City Department of Health, most recently as Deputy Commissioner of Health.

PHILIP W. FENNEY, M.D., of West Haven, Conn., has been appointed Medical Director of the Connecticut State Welfare Department. Dr. Fenney succeeds LEONARD PARENTE, M.D.,† who resigned last month after 4 years with the department, to become Health Officer of Hamden, Conn.

JANET F. NELSON, PH.D., has been appointed Director of Marriage and Family Life Education of the Planned Parenthood Federation of America, New York, N. Y. The service is new and will reach 350 local groups affiliated with the federation to develop services considered essential to the strengthening of the American family. Dr. Nelson has been serving as Consultant on personal and family relationships from the U.S.O. division of the Y.W.C.A.

FRED L. MOORE, M.D., M.P.H.,\* who has been Professor of Social and Environmental Medicine at the Long Island College of Medicine, Brooklyn, N. Y., has resigned to accept appointment as County Health Officer in the Barnstable County Health Department, Barnstable, Mass.

THEODORA SHARROCKS, R.N.,† recently joined the staff of the American Journal of Nursing as field representative. A graduate of Presbyterian Hospital and Teachers College in New York, she has been on the supervisory staff

of the Visiting Nurse Service of New York City since 1937.

MORRISON C. STAYER, M.D.,\* who retired from the Army with the rank of Major General, has been appointed Director of the Bureau of Tuberculosis Control in the Pennsylvania State Department of Health. Dr. Stayer will succeed DALE C. STAHLER, M.D., who has resigned to enter private practice.

### Southern States

JUAN JOSE ALCOCER C., M.D., M.P.H., who recently completed the course at Johns Hopkins School of Hygiene and Public Health in Baltimore, has been appointed Director of State Public Health and Welfare Services in Sonora, Mexico, with offices in Hermosillo.

GEORGE M. DECHERD, JR., M.D., Galveston, Tex., has been appointed Director of the Student Health Service of the University of Texas at the Austin campus. He is relinquishing his positions at the medical branch at Galveston as Director of the Heart Station and as Director of the post-graduate training program but is retaining his title as Professor of Medicine.

C. HOWE ELLER, M.D., DR.P.H.,\* formerly Health Officer of the Eastern Health District, Baltimore, Md., has resigned to accept a position as Director of Health of the City of Richmond, Va.

JAMES L. HAMNER, M.D., Mannboro, Va., has been appointed a member of the Virginia State Board of Health, effective July 1, succeeding JOHN B. JONES, M.D., Petersburg, resigned.

### CHANGES IN HEALTH PERSONNEL IN KENTUCKY:

EDWARD M. THOMPSON, M.D.. Rus-

\* Fellow A.P.H.A.

† Member A.P.H.A.



sellville, has been appointed Acting Director of the Lexington-Fayette County Health Department.

OSCAR V. BROWN, M.D., Island, has been appointed Health Officer of McLean County.

JESSHILL K. LOVE, M.D., Herrods Creek, has been appointed Medical Director of the 11 Cancer Clinics operating in the state.

OKLAHOMA STATE DEPARTMENT OF HEALTH ANNOUNCES CHANGES IN HEALTH OFFICERS:

GEORGE W. WINN, M.D.,† Lawton County Superintendent of Health of Comanche County.

JAMES M. GORDON, M.D., Ardmore, County Superintendent of Health of Carter County.

WILLIAM W. COTTON, M.D., Atoka, County Superintendent of Health of Atoka County.

ALFRED R. SUGG, M.D., Ada, County Superintendent of Health of Pontotoc County.

SAMUEL MARSH, a lawyer of Kansas City, has been named by Governor Donnelly as Director of the Division of Public Health and Welfare. The appointment is subject to confirmation by the Senate. As Director of the Department of Public Health and Welfare, Mr. Marsh is administrative head of three divisions, public health, mental diseases, and welfare, provided by the new Missouri Constitution.

JEAN B. PINNEY,† Editor of the Journal of Social Hygiene, and Director of the American Social Hygiene Association's Washington Liaison Office, during the war years, has returned to the Association's National Headquarters at 1790 Broadway, New York, where she is serving as Secretary of the Committee on International Relations and Activities and Director of the

Liaison Office for International Social Hygiene Agencies and Activities, which is being sponsored by the committee.

SOUTH CAROLINA STATE DEPARTMENT OF HEALTH ANNOUNCES CHANGES IN HEALTH OFFICERS:

CHARLES I. GOODWIN, M.D., Holly Hill, was appointed to succeed the late GROVER C. BOLIN, M.D.,† as Director of the Orangeburg and Calhoun County Health Departments.

CAROLINE H. CALLISON, M.D.,† Chat-ham, has been granted a leave of absence as Director of the Greenwood and McCormick County Health Departments to take a course in Public Health at Columbia University. During her absence MAULDEN J. BOGGS, JR., M.D.,† Health Officer of Abbeville, will be in charge of the Greenwood and McCormick Health Units.

J. H. STEPHENS, M.D., has been appointed Director of the Division of Sanitary Engineering in the South Carolina State Board of Health with offices in Columbia, S. C. Included in the Division are the sections of: water and sewage, milk and shellfish, hotels and restaurants, and meat processing and handling.

CHANGES IN HEALTH PERSONNEL IN TENNESSEE:

JOHN M. WEIR, JR., M.D.,† New York, has been named Health Officer of the Obion-Lake County Health Unit, filling the vacancy that occurred when WILLIAM L. PHILLIPS, M.D.,† resigned last October.

PRICE H. DUFF, M.D.,† formerly of Crassville, has been appointed Health Officer of Rutherford County, Murfreesboro, succeeding JAMES B. BLACK, M.D., who resigned effective July 1.

\* Fellow A.P.H.A.

† Member A.P.H.A.

WALTER C. HUMBERT, M.D.,† Erwin, has been appointed Director of Giles and Lincoln Counties.

GEORGE K. HENSHALL, JR., M.D., Chattanooga, has been named Director of the Division of Maternal and Child Health, Chattanooga-Hamilton County Health Department to succeed RUTHERFORD O. INGHAM, M.D.\*

#### CHANGES IN HEALTH PERSONNEL IN VIRGINIA:

J. C. NEALE, JR., M.D., Norfolk, Assistant Director of the Department of Public Health, has been named Director.

PEYTON M. CHICHESTER, M.D., Richmond, Assistant Director, has been chosen Acting Director of the Bureau of Tuberculosis Outpatient service and Crippled children's service.

JACK B. PORTERFIELD, M.D.,\* who recently resigned as Health Officer of Richmond, effective November 15, will return to the State Board of Health as an Assistant Director in the Bureau of Local Health Services. He has been succeeded in the Richmond position by CHARLES HOWE ELLER, M.D.,\* Baltimore, Md.

JAMES DUDLEY, M.D.,† Health Commissioner of Newport News, has resigned to accept a similar position with the city of Roanoke.

HENRY C. BRADFORD, M.D., Falls Church, has been appointed Health Officer of Fairfax County, with headquarters in Fairfax.

JAMES A. FIELDS, M.D., has been appointed Health Officer of Pittsylvania and Halifax Counties with headquarters in South Boston.

B. RANDOLPH ALLEN, M.D., Director of the Bureau of Communicable

Diseases, Virginia State Department of Health, has resigned to join the Veterans Administration.

WILLIAM A. BROWNE, M.D., Assistant Director, Richmond Department of Health, has resigned.

#### Western States

##### CHANGES IN HEALTH PERSONNEL IN WASHINGTON;

HERBERT E. TOMLINSON, M.D., recently released from military service, has been appointed Industrial Consultant for the Industrial and Adult Hygiene Section, State Department of Health.

BURTON A. FOOTE, M.D., of Washington, D. C., has been temporarily appointed Health Officer of Kittitas County, succeeding CONRAD E. ROSDAHL, M.D.,† Spokane, resigned.

CHARLES E. REDDICK, M.D.,† Paducah, Ky., has been named Health Officer of Pierce County, succeeding HAROLD MARKS, M.D., Washington, D. C., who has joined the staff of Pierce County Medical Bureau.

MARY B. CHAMBERLAIN† has been appointed to succeed HELEN HARTLEY, R.N.,† who recently retired as Superintendent of Nurses in the San Joaquin Local Health District, Stockton, Calif., effective January 1:

F. HERBERT COLWELL, DR.P.H.,† has joined the staff of the Public Health Statistics Section of the Department of Health, Smith Tower, Seattle, Wash., and will serve as Public Health Statistical Consultant. Dr. Colwell has had several years of training and experience in public health statistics and will head the Sub-Section of Statistics of this Section.

MAJOR EUGENE M. HOWELL,† recently of the Sanitary Corps, U. S. Army, has been appointed Sanitary Engineer for the San Joaquin Local Health District, Stockton, Calif., effective January 6.

\* Fellow A.P.H.A.

† Member A.P.H.A.

ALFRED R. MASTEN, M.D.,† Director, Division of Tuberculosis Control, Colorado State Board of Health, Denver, has been appointed to the Administrative staff of the Oregon State Board of Health, Portland.

FRANK H. RODIN, M.D., has resigned as ophthalmologist to the Bureau of Child Hygiene, San Francisco, Calif., Department of Public Health. Dr. Rodin held this position for 20 years. He has been succeeded by THOMAS G. HALL, M.D.

THERESA WOO, M.D., formerly a captain in the medical corps of the U. S. Army, was recently appointed Pediatrician with the Bureau of Maternal and Child Health of the Board of Health, Hawaii. She succeeds MARTHA W. GROVES, M.D., nee MARTHA C. WAGER, who resigned in June.

HARLIN L. WYNNS, M.D.,\* formerly Director of Communicable Diseases of the California State Department of Health, is serving temporarily as Medical Officer of the San Joaquin Local Health District, Stockton, Calif.

### Foreign

C. C. P. ANNING, M.D.,† has been appointed Medical Advisor to the Social Services Committee of the Chamber of Mines, Johannesburg, S. Africa. He recently has been admitted to the British Order of CBE for his work in the Italian campaign and he has received the Bronze Star from General Mark Clark of the American Army. He served with the Sixth South African Armored Division in charge of Medical Services.

DAVID RESNICK,\* has returned from Paris, France, where he organized the European Public Relations Department of the American Joint Distribution Committee and has resumed his services in public relations and publicity at 1775 Broadway, New York 19, N. Y.

### Mexico

RAFAEL PASCASIO JAMBOA, M.D., has been appointed Minister of Public Health and Welfare of the Republic of Mexico. The announcement was made by President Aleman.

### Deaths

PORTER JAMES CRAWFORD, M.D.,\* Director of the Caribbean region of the International Health Division of the Rockefeller Foundation, died recently at Havana, Cuba, at the age of 51. He joined the Foundation in 1928 and from 1928 to 1934 Dr. Crawford was in Brazil, studying measures for the control of yellow fever. The next 3 years he served in Panama, making studies of the same kind in relation to malaria. He was made Regional Director in 1939.

THOMAS H. MILFORD,† Chief Engineer and Director, Bureau of Sanitation, State Department of Health, Montgomery, Ala., was killed in an automobile accident on November 2, 1946, in Montgomery.

\* Fellow A.P.H.A.

† Member A.P.H.A.

### CONFERENCES AND DATES

American Association of School Administrators. Atlantic City, N. J. March 1-6.

American College of Hospital Administrators. Stevens Hotel, Chicago, Ill. February 17-21.

American Dental Association—Annual Meeting. Boston, Mass. August 4-8.

American Dietetic Association. San Francisco, Calif. October 13-17.

American Hospital Association. Annual Convention. St. Louis, Mo. September 22-25.

American Medical Association—43rd Annual Congress on Medical Education and Licensure. Palmer House, Chicago, Ill. February 10-11.

American Public Health Association—75th Annual Meeting. Atlantic City, N. J. Week of October 6.

# American Journal of Public Health

## *and* THE NATION'S HEALTH

---

Volume 37

March, 1947

Number 3

## The Health Department and Medical Care\*

Responsibility of the Health Officer in a Medical Care Program

F. W. JACKSON, M.D.

*Deputy Minister, Department of Health and Public Welfare,  
Winnipeg, Manitoba, Canada*

EVER since the first appointment of a full-time health officer, about one hundred years ago, his responsibilities in health administration have increased and broadened until at the moment we find him intimately concerned not only with all aspects of disease prevention and health protection, but with many phases of medical care as well.

Even before this, as far back as 1665, the time of the great plague in England, government officials in their efforts to control the spread of the disease found it imperative to provide treatment facilities. From the so-called pest houses of those days there has evolved a rational provision of treatment hospitals for all communicable disease. Health officers have had written into local, and other government health legislation, the necessary authority to provide the facilities for the treatment of these conditions. Although in the first instance such treatment was not

provided wholly as a function of the state, in the last few years more and more of the population requiring treatment for diphtheria, scarlet fever, and other communicable conditions have been receiving the necessary medical care at the expense of the state. Today in Winnipeg, the capital city of Manitoba, treatment of the major communicable diseases for all persons requiring such service, is provided at the taxpayer's expense.

When official health agencies entered the fields of tuberculosis and venereal disease control it soon became apparent that effectual control of these conditions could be obtained only when treatment of individuals suffering from these diseases was provided; so the health officer was compelled by force of circumstance to make sure that the state had available these necessary facilities to make control effective.

Now almost every health officer has at his disposal ample facilities for the treatment of both tuberculosis and venereal disease. In many, if not most, instances such treatment is considered an integral part of the health depart-

---

\* Presented at a Special Session of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 12, 1946.

ment's function. In nearly all the provinces of Canada these services are provided from tax funds, with no direct charge to the individual.

The care of mental disease has always been the responsibility of government, and in most jurisdictions is now under the control of the health officer. In every province in Canada except one the care of mental disease is a part of the health department's function.

In Manitoba there are operated wholly from tax funds more hospital beds for mental and communicable diseases, including tuberculosis, than all those contained in the voluntary general hospitals.

In the past few years there has been a growing public demand for the further entry of the State into the field of medical care. In one province in Canada, Saskatchewan, cancer diagnosis and treatment has been completely assumed as a health department responsibility, and the service is paid for by the State.

Several years ago there were presented to the federal government at Ottawa many requests that government provide facilities for the treatment of arthritis. The pressure grows year by year. The same applies to the care and treatment of crippled children.

So, whether the health officer likes it or not, as an official of the government he is concerned with and must take part in the provision of medical care, at least in selected fields.

For more than twenty-five years the Provinces of Manitoba and Saskatchewan have had a salaried municipal medical service. In both provinces the control of this type of medical care ultimately became vested in the official provincial health agency. This control not only extends to the protection of the public's interest but also the interests of the medical man concerned in assuring him a reasonable contract. At the present time there are 17 salaried municipal physicians in Manitoba.

In 1942 when the federal government of Canada started to consider the possibilities of health insurance they turned to the federal department of health to gather information and prepare plans for medical care in Canada. The Canadian Medical Association and the official health agencies of the several provinces of Canada, through their organization, the Dominion Council of Health, were constantly consulted during the preparation of the proposed legislation. The Canadian Public Health Association was asked to submit a brief to the Social Security Committee when the proposal was finally being considered. They recommended that any plan of health insurance for Canada should be administered by provincial health departments as part of their regular function. The Canadian Medical Association in their submission opposed this proposal and requested provincial administration by an independent commission with official health representation. When the legislation was finally drafted the decision as to the method of administration was left to the discretion of the provinces. Unfortunately, for the time being, this legislation is in a state of suspended animation due to the breakdown in the Dominion-Provincial Conference negotiations on fiscal need as between the Dominion and provinces.

In the western provinces of Canada where the problem of adequate provision of health services is an urgent one, especially for our rural people, we felt that we could not wait any longer for federal leadership. In both Manitoba and Saskatchewan a start has been made in a medical care program which will ultimately lead to a complete coverage of all our people for both preventive and curative health care.

#### HEALTH SERVICES ACT

The Department of Health and Public Welfare in Manitoba has noted for

many years, with some considerable alarm, the trend in the distribution of medical facilities, where, despite an increasing rural population, we find a decreasing number of medical personnel willing to locate in our rural areas.

Agriculture is the major industry of our province and its well-being, upon which depends the prosperity of Manitoba, must have four things, in the following order of importance, if we are to make living conditions in our rural areas attractive enough to keep people on the land:

1. More health services
2. Rural electrification
3. Modern educational facilities
4. Better roads

Naturally our provincial government and the public look to their official health agency to plan for better health services.

Our modest Health Plan when it was finally approved by the government, and before its formal presentation to the public, was discussed with organized medicine through the executive committee of the Manitoba Medical Association. All the details of the legislation, the content of services to be provided, the method of payment for these services and their administration, were discussed with and approved by organized medicine before such legislation was formally presented for government consideration. As a result of this policy there was no dissenting voice when the Health Services Act was under consideration by the committee of the legislature, and the bill finally passed the House by a unanimous vote.

#### A. Preventive services

We believe that the only sound foundation for better health services, from every aspect, is that of prevention. We think that first things come first, so prevention of disease through complete coverage for all our rural areas by full-time local health units is the

first objective of our Plan. In less than two years, 42 per cent of this objective has been obtained, and the province would have been completely covered by 1946 if medical, nursing, and other personnel had been available.

This service is provided by provincially appointed civil-service personnel with local participation in the cost of the service and its administration. We believe that this is necessary in order that we may have a local administrative organization for the other services, such as diagnostic facilities and prepaid medical care.

#### B. Diagnostic facilities

I think all agree that one of the chief causes of the increasing cost of treating illness is the use of the many new and sometimes expensive diagnostic procedures now considered necessary to practise medicine in an intelligent manner. In our province diagnostic facilities are practically nonexistent in the rural areas, so that rural people must travel many miles to one or the other of three cities where such services are available. This is not only expensive for the patient and his family but has the tendency to centralize medical care in a few places. As a result the chance of a young medical practitioner either practising medicine in a scientific manner or making a reasonable living in a rural district is slim. We believe that if we make adequate diagnostic facilities readily available to all physicians, both these disabilities can be at least partially overcome.

Using the local health unit district as the base and starting point, the diagnostic services will be provided through the local health unit administration and its director. The central government provides the services; the local community will share in the cost and administrative responsibility.

The first diagnostic unit will go into operation in the area where the first

rural health unit was established. The technical personnel has been trained, the equipment secured, and operation of this unit will begin March 1, 1947. Just as quickly as more equipment and personnel are available, this service will be extended, health unit by health unit, until ultimately all rural areas will be covered.

The capital cost of the equipment for the service is assumed by the provincial health department, and all personnel are, and will be, departmental employees. The local community assumes, out of tax funds, one-third of the operating cost. The service will be provided through approved local general hospitals and only on the request of a licensed practising physician.

### *C. Prepaid medical care*

When a community has the two services mentioned, and then only, are they entitled to assistance from the central authority for prepaid medical care. We believe that the treatment of illness is a personal thing between patient and doctor; so the method of prepayment should be left to negotiation between the local community and organized medicine. When this service has been provided by a community, the province will contribute on a per capita basis to the cost of such care.

To standardize the services that may be provided by a salaried physician in a community, there has been written into the law of our province, through the Health Services Act, a standard form of "Municipal Doctor Contract" setting forth the services that the physician shall render, the salary he shall receive, the perquisites in respect to holidays, postgraduate time, etc., to which he shall be entitled. This contract was prepared by an advisory commission under the Health Services Act and has been approved by the Manitoba Medical Association.

We believe this is an important ad-

vance in assuring that a good general practitioner service will be provided for our rural people at a cost that they can afford to assume and will assure the medical man of a decent living and agreeable working conditions. Ultimately, the contract will provide a pension plan and sick leave privileges.

### HOSPITAL FACILITIES

Putting a medical man in a rural community to practise is not enough. He must have a workshop, and the doctor's best workshop is and always has been a hospital, so the plan makes provision for this.

Hospitals will be of three kinds: (1) The smallest is a medical nursing unit, for maternity and medical cases. The doctor's office and space for health unit activities will be situated in the same building. We will require about 75 of these units. These will be complementary and contributory to (2) the district hospitals, some 34 in number, varying in size from 25 to 75 or more beds, equipped to do all ordinary major surgery and containing the diagnostic facilities previously mentioned. The district hospitals will be feeders to (3) the area hospitals of which there will be four. Ultimately, each of these will be of a standard capable of doing practically everything required in a medical care program with the exception of thoracic and neurosurgery. These, and some other conditions, in a small province such as ours, should only be treated at the medical center, the teaching center, in Winnipeg.

The capital expenditure required for the erection of hospitals of any type will be the sole responsibility of the community in which the hospital is built. The location of the hospital, its size, the type of construction and the work it shall perform, will be decided by the central authority, the provincial department of health, with the aid of an advisory hospital council. We believe

this control is essential if an orderly development of hospital service is to be provided.

It is interesting to note that material progress is already being made in the reorganization of our hospital facilities. One district has raised by subscription the necessary money to bring their hospital up to standard. Two districts have voted to raise the money by taxation to build new district hospitals. In both instances the vote carried by a large majority.\* Three more districts will vote on November 22. Thirteen others either have schemes under consideration or have requested the Minister to prepare a plan for hospital facilities for them. So in 19 of the 26 districts where new construction is required, action has been or is being taken.

#### SUMMARY

This unpretentious Health Plan in Manitoba makes the health officer, both centrally and locally, the guiding hand in its physical administration, and we believe this is as it should be. Our rural people look to their government for leadership and guidance in this field. They say, quite rightly, that they pay for the up-keep of a health department, which supposedly has personnel especially trained for the protection of the province's health. Medical care is only one phase of that protection, and the public expects us to organize and direct all activities that may be required to provide an adequate all-over health service. This is evident by the fact that the Manitoba Pool Elevator Association, the largest farmer's coöperative organization in our province, is subsidizing the Plan by making a substantial grant to any hospital in rural Manitoba that is remodeled or erected, and that comes within the scope of the Plan, such grant being paid only on the

recommendation of the Department of Health and Public Welfare.

Our government believes that where tax funds are being spent, whether those funds are collected directly or indirectly, the administration spending such money should be held directly responsible to the people through the elected members of the legislature. In Manitoba the administration of the Health Services Act is the responsibility of the Department of Health and Public Welfare.

Ample safeguards both to the public and to the medical profession to prevent so-called bureaucracy are provided in the legislation through the establishment of an Advisory Commission, which adequately represents those providing the service and those who are to receive it. I would like to pay tribute to the work of all members of the Commission, with special mention of the medical members, past and present: Dr. Fred McGuinness, President-elect of The Canadian Medical Association; Dr. Pat McNulty, past-President of The Manitoba Medical Association; Dr. A. Hollenberg, Chairman of the Committee of Medical Economics of the Manitoba Medical Association; and Dr. A. T. Mathers, Dean of the Faculty of Medicine of the University of Manitoba. All have given and are giving generously of their time and special knowledge in order that the Plan may become fully operative as soon as possible and provide better health care for our people.

The Premier of our Province, the Hon. Stuart Garson, in speaking of the Health Plan has said "I do not know of any country whose government has received as whole-hearted coöperation from the medical profession in its attempts to provide better health services than has Manitoba."

I would like to take this opportunity to thank the many organizations in the United States who have helped us in our planning: the American Public Health Association and the Common-

\* Four Hospital By-laws were approved by vote of the ratepayers on this date.



wealth Fund for Dr. Carl E. Buck's study in 1941 of "Public Health in Manitoba," the Kellogg Foundation and the American College of Surgeons for assistance and guidance in the survey completed in 1944 of our hospital facilities, and the Rockefeller Foundation for a study just completed on the training facilities required in our province to provide the necessary personnel to implement our Health Plan. The people of Manitoba deeply appreciate this assistance.

In closing I should like to suggest that health officers as employees of government should, with the coöperation of organized medicine, assume the responsibility of assuring that the maximum effort is put forth so that everyone; no matter where he may live or what his economic status may be, has without unnecessary delay, everything medical science has to offer for the promotion of health, the prevention of disease, and the care of the sick.

---

## The Year 1946 in Public Health

In the 1946 annual reprint of the U. S. Public Health Service recently issued, Surgeon General Thomas Parran hailed three moves of the year as great public health advances. They are:

a. The Hospital Survey and Construction Act which established a national policy whereby hospitals and health centers are to be planned, located, and operated in relation to the overall health needs of the people;

b. The National Mental Health Act which provides for research and other facilities for dealing with the mental disorders that affect, to some degree, about 8,000,000 Americans

and fill more than half the country's existing hospital beds;

c. The constitution of the new World Health Organization setting forth a new philosophy of international health relations that it is in the interest of the more advanced nations in health matter to assist less fortunate nations.

He pointed out two frontiers of public health not yet conquered—the area of chronic diseases, particularly those of old age, and the extension of necessary health services to all citizens, regardless of geographic and economic inequalities.

# The Health Department and Medical Care\*

## Maryland Medical Care Program

DEAN W. ROBERTS, M.D.

*Chief, Bureau of Medical Services, Maryland State Department of Health,  
Baltimore, Md.*

THE Maryland Medical Care Program is the product of a careful study of community medical care needs conducted by the State Planning Commission over a period of four years. The study was originally suggested in 1939 by the State Medical Society in an open letter to the Planning Commission which pointed out many of the existing deficiencies in provisions for medical services. A field survey of each county was carried out in order to evaluate the particular needs of individual counties.

On completion of the study in 1944 the Planning Commission had reached the conclusion that there was no agency in the state, either official or nonofficial, whose particular responsibility it was to see to it that the poor received adequate medical care. The remedial recommendations of the commission were endorsed by the state medical society, and in 1945 a law was passed charging the State Department of Health with the responsibility of administering a program providing medical hospital, nursing, and dental care for the indigent and medically indigent of the state. The term "indigent" has been defined for the purposes of this program as those persons who are recipients of public assistance from the Department of Public Welfare. A per-

son is "medically indigent" when he is unable through his own resources to provide himself and his dependents with proper medical, dental, nursing, and hospital care without depriving himself or his dependents of necessary food, shelter, clothing, and similar necessities of life. Other new laws provided for the licensing of all hospitals and nursing homes, and for the construction of three chronic disease hospitals with a total of 1,300 beds, to be administered by the State Health Department. The 1945 State Legislature also passed a law enabling hospital insurance plans, such as Blue Cross, to expand their voluntary insurance program to include coverage of the services of private physicians as well as the services of hospitals. The Legislature has made provision, therefore, for adequate medical care through taxation for those with little or no income, and through voluntary insurance for the middle income group who can meet the cost of medical care by the payment of regular insurance premiums.

### COÖPERATION OF MEDICAL PROFESSION

The endorsement of the program for the indigent and medically indigent by the medical profession represents an important landmark in Maryland. It represents the finding of a common ground of agreement as regards medical care between the state government and the medical profession. The responsi-

\* Presented at a Special Session of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 12, 1946.

bility of government to provide care for the medically indigent is clearly recognized, and a framework is established for a developing partnership between government and the medical profession, with the goal of bringing high quality care to a group of the population who in the past have received grossly inadequate medical care. The importance of this common ground of agreement between government and the medical profession cannot be overemphasized.

The discussion of public medical care has frequently been so inflamed by proposals totally unacceptable to professional groups that many have gained the impression that coöperation toward a common goal is impossible. Professional groups resist sweeping proposals placing government in a dominant position in medicine because they are afraid of what it will do to them as individuals and as professional groups. This seeming impasse can be resolved if agreement can be achieved on limited programs and if government can administer these limited programs in such a way as to provide improved services through administrative methods acceptable to physicians, dentists, and hospitals. The confidence of professional groups will be gained, not by angry debate, but by coöperative exploration of areas of agreement.

#### MEDICAL CARE FOR NEEDY IN HEALTH DEPARTMENT

Responsibility for medical care for the needy has fallen on the shoulders of welfare agencies in a majority of the states more by default than by plan. Those in charge of public assistance programs have been sensitive to the medical needs of their clients and have developed a wide variety of programs in an attempt to meet these needs. The Maryland Planning Commission recommended that the administrative agency for this Medical Care Program be the Health Department. This decision was

based on their conviction that medical care was a logical and appropriate expansion of health department activities. Physicians in general prefer to deal with medical agencies and in Maryland they indicated a clear preference to have the program administered by the Health Department rather than by the Welfare Department. The long experience of the Health Department in administration of preventive medical programs of a categorical nature such as tuberculosis, venereal disease, crippled children, and maternal and child care, provides a background on which a general medical care program with emphasis on prevention can be built.

There is no inconsistency between the traditional preventive activities of health departments and the administration of medical care programs. Early diagnosis and treatment are in themselves preventive measures and are appropriate responsibilities of a health agency. Public health recognized long ago that the prevention of tuberculosis could not be divorced from treatment; that the prevention of maternal deaths lay in the modern treatment of the pregnant woman. It is equally true that the prevention of deafness lies in the proper treatments of otitis media; that the prevention of pneumonia is partly through treatment of common upper respiratory infections. Cancer deaths are prevented through detection and treatment of early cancer and pre-cancerous lesions. Positive dental health involves treatment of dental caries before the tooth is destroyed. Any dividing line drawn between preventive medicine and curative medicine is, therefore, highly artificial.

#### IMPLEMENTATION OF MEDICAL CARE PROGRAM

The implementation of the medical care law began with the organization of the State Council on Medical Care, an advisory group representative of the

official medical, dental, pharmaceutical, nursing, and hospital associations, as well as the two Maryland medical schools, and official state health and welfare agencies. This group has met monthly and has guided the State Board of Health in the development of every phase of the program. One of the early decisions was that the program be decentralized and that local administrative responsibility be placed in the county health departments in order that diagnostic and curative services might be more fully integrated with preventive services. County advisory committees, composed of physicians, dentists, pharmacists, representatives of health and welfare agencies, the county commissioners and other lay groups, were established in each county to assist the health officer in organizing the program and carrying it out. Counties were given a wide latitude in determining services to be offered in order that the program might be tailored to meet the most pressing needs of each community. All counties provide home and office care by physicians, drugs, and care of acute dental conditions. County programs vary considerably, however, in the degree to which services such as, surgery, obstetrics, consultations, elective dentistry, nursing care, and diagnostic laboratory services are provided. These differences reflect variations in need from county to county and limitations of program due to budget.

Experience is showing that a simple means test for the medically indigent can be applied by the health department staff without embarrassment of the patient and without developing special investigative machinery. Eligible persons, whether indigent or medically indigent are provided with wallet size identification cards which they are instructed to present to the physician of their choice if they become ill. The physician renders the needed services and at the end of the month submits a

brief medical report to the county health department. After approval by the county health officer, data on this report are transmitted to punched cards, and a payroll and other statistical data are run off mechanically. Payment is issued on a fee-for-service basis following a uniform fee schedule adopted after consultation with county advisory committees. Similar procedures are followed in the provision of dental services and drugs.

#### SERVICES RENDERED

The volume of services rendered has grown rapidly, and currently the program provides services to approximately 3,300 persons per month, of which 83 per cent are indigent, that is, public assistance clients, and 17 per cent medically indigent. Counties have varied widely in the emphasis placed on the medically indigent phase of the program, and in some counties as high as 60 per cent of the patients are in this group. The monthly cost of services is about \$25,000, of which 80 per cent is for physician services, 13 per cent for drugs, and 7 per cent for dental care. In reviewing these figures it must be borne in mind that the program is serving only the counties of Maryland and that Baltimore City is not covered. The counties have a total population of about 1,000,000 and a public assistance load of approximately 15,000 individuals. The implementation of the program has been facilitated by the fine spirit of coöperation of professional groups. Approximately 75 per cent of the physicians, 70 per cent of the dentists, and 90 per cent of the pharmacies are rendering services through the program.

The majority of the patients are in the older age groups and most of them have chronic illnesses requiring care over a long period of time. Facilities for the care of this group will be greatly strengthened on completion of the three

chronic disease hospitals. The raising of standards of nursing homes through administration of the licensing law will also be an important factor in the provision of better care for the chronically ill.

#### SERVICES PROJECTED

The primary objective of the program is to bring adequate medical, dental, and nursing care to the poor. Inability to pay must not prevent people from getting good medical care early in the course of disease. It was not expected that this goal would be fully achieved in the first year. The program has many deficiencies which must be overcome by carefully planned extensions to meet the most pressing needs. Emphasis must be placed on early diagnosis and treatment. Early diagnosis frequently depends on the diagnostic facilities available to the physician. It will be important for the health department to provide essential diagnostic facilities in communities where they are not otherwise available. The importance of staffing and equipping the branch laboratories of the health department for the performance of clinical laboratory tests, such as hematology, blood chemistry, urinalysis, etc., cannot be overestimated. Many counties have requested consultation clinics. Shortage of personnel has made this impractical until now, but it should soon be possible to bring consultation services in the major medical specialties to every county, either through visiting consultants or through qualified local consultants.

Although the dental phase of the program has made progress, it still meets only a small fraction of total dental needs of the poor. Even though money were no problem, there are not enough dentists to do the work needed. The program is caring for a predominantly elderly group whose teeth have been neglected for many years. It is im-

practical to provide the fillings, extractions, and dentures required to bring back good dental health to this group. Instead, emphasis must be placed on relatively complete dental care for children and young adults, to prevent their teeth from becoming hopelessly decayed.

The medical care law provides for bedside nursing for eligible persons. Many chronically ill persons now admitted to hospitals or nursing homes could be satisfactorily cared for at home with a reasonable amount of help and guidance from properly trained visiting nurses. Due largely to the acute shortage of personnel, the volume of nursing care provided has remained quite small. This phase of the program is being developed through the public health nursing staff of the department. Nurses' bags are being provided with the equipment necessary for bedside nursing and an in-service training program will bring the public health nurse up to date on bedside nursing techniques. A demonstration has been started in one county in which we hope to develop in detail, sound working policies for a rural community nursing service. Full development of such a program in all counties will require the doubling or tripling of present nursing personnel and will hinge considerably on funds made available for this purpose.

Due largely to inadequate budget, the program has provided for only a small fraction of the medically indigent who need help in obtaining adequate medical care. The need of this group is fully as great as that of the public assistance clients. With the return of normal unemployment levels they will present a problem which must be met.

#### SUMMARY

For the past sixteen months the state and county health departments in

Maryland have been responsible not only for preventive medicine but for diagnostic and curative medicine for the individual patient. This new responsibility has brought with it adventures on a new frontier which offers public health its greatest opportunity for constructive leadership. Although many unmet needs remain, the Maryland program can point to certain achievements. For the first time the state government has made it public policy to provide medical care to the needy. The health department was honored by being chosen to implement this policy. It has been possible for the health department to sit down with interested professional and lay groups and, through democratic procedures, plan a program upon which all could agree. In many communities

the program has for the first time brought social, professional, and lay groups together in a constructive effort to coordinate their many activities bearing on the field of health.

The fear of some that responsibility in the field of medical care would somehow interfere with the traditional preventive work of the health department has not materialized. There are numerous ways in which the preventive and curative phases of the program can be integrated so as to be mutually supportive. Finally, the activities of the health department in this field has focused attention of the public on health work as never before. Relationships with physicians and other professional groups have been strengthened at both state and county levels.

---

## Federal Civil Service Examinations for Statisticians

The U. S. Civil Service Commission announces an examination for probational appointment to high-grade statistician positions in Washington, D. C., and vicinity at annual salaries ranging from \$5,905 to \$9,975. Applicants will be rated on their experience and relevant training without written examination. Applicants must have had progressively responsible professional

experience in statistical research. At present applications will be considered until further notice.

Applicants who wish early appointment, however, should request application forms immediately from first- or second-class post offices, the Commission's regional offices, or direct from the Civil Service Commission, Washington 25, D. C.

# The Health Department and Medical Care\*

## Group Practice in Preventive Medicine

DEAN A. CLARK, M.D.

*Medical Director, Health Insurance Plan of Greater New York, New York, N. Y.*

WHEN we speak of "preventive medicine" we are very apt to think primarily of the brilliant sweep of modern public health science across the country, reducing or even eliminating water-borne and milk-borne infections, venereal diseases, malaria, yellow fever, or typhus. Or perhaps we have in mind the prevention of the ravages of diphtheria through mass immunization. But usually we put as distinctly secondary the innumerable preventive measures for the individual that must so largely be carried out by the practising physician. Yet today it is these individual preventive measures which constitute the main hope for the prevention of disease and disability.

### PREVENTIVE AND CURATIVE MEDICINE

As a matter of fact, if we are to understand the potential scope of prevention by modern techniques, we must agree that "Any procedure which serves to ward off disease or maintain health is to be considered preventive medicine." This definition, phrased by William Davis† is broad indeed but none too broad to make clear the real issues we are facing. Davis continues, "Such preventive procedures defy classification into rigid groups, for they range from the impersonal measures of environmental sanitation to curative

medicine for the individual. Is the hospitalization and treatment of a woman with typhoid fever to be called curative medicine for her or preventive medicine for the community? Should the early treatment of syphilis be classified under contagious diseases or under the prevention of mental disease? If a man has a job where he eats irregularly, is tense, and has indigestion, and he sees his doctor and as a result gains insight into his anxiety, is placed at a different job in his industry, goes on a better diet and gets well, is this a triumph for gastroenterology? or industrial hygiene? or nutrition? or psychosomatic medicine? And is it curative of anxiety or preventive of a stomach ulcer?"

The point is, obviously, that preventive and curative medicine are no longer separable (if indeed they ever were); both must be included in anything we would wish to recognize as complete medical care. The health officer and the practitioner are both involved in preventive medicine today—in fact, the larger share now belongs to the practitioner, although many in both the public health and the medical professions fail to recognize it as yet.

Take, for example, the prevention of communicable disease, traditionally the realm of the health department. In the case of measles, it is the practitioner who must first take steps to administer gamma globulin if the new-born infant is to be spared this serious disease, caught from his older brother or sister. Even where the technique of preven-

\* Presented at a Special Session of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 12, 1946.

† Davis, William A., M.D., Assistant Professor of Preventive Medicine, New York University College of Medicine. Unpublished paper.

tion is largely through mass measures, the attending physician must be relied upon to recognize the disease, properly isolate and treat his patient, and report the case, say, of diphtheria, malaria, dysentery, or indeed venereal disease, tuberculosis, and smallpox.

But, in the fullest sense, prevention is not confined to stopping the *communication* of such diseases; it is equally concerned with the prevention of their complications or sequelae. It is the practitioner who is responsible for the prompt and efficient treatment of pneumonia or scarlet fever or meningitis if his patient is not to have life-long crippling effects from them.

The physician's rôle in prevention can be even more easily seen in diseases which are not communicable. Only the expert diagnosis and intelligent treatment of the physician can prevent the otherwise almost certain destructiveness of cancer, diabetes, hyperthyroidism, glaucoma, the allergies, and emotional disorders. More general recognition has already been given to the preventive functions of practitioners in pregnancy and in infancy.

The techniques used by the physician in his preventive activities run the whole gamut of medical science, from a careful history and physical examination to the most complex laboratory, x-ray, or instrumental procedures, from thyroid surgery to health education. Indeed, every type of skill and every technical device known to medicine has its preventive as well as its diagnostic or curative rôle to play.

The preventive medicine of today, then, is extricably bound up with the quality and distribution of medical care. It is safe to say that at least three-fourths of the preventive work made possible by present-day medical science must be carried by the practicing physician. It follows, obviously enough, that any health officer or other public health worker who desires ma-

terially to increase the effectiveness of preventive medicine today must devote a major portion of his effort to improvement of the organization of medical, dental, and nursing services, and to their adequate application for the benefit of the individuals of the community.

#### GROUP MEDICAL PRACTICE

The very breadth of scope of the preventive measures we can now apply with scientific exactitude indicates that no single physician, however brilliant, can hope to furnish them all. No one individual can possibly acquire all the skills that are required for surgery, psychiatry, ophthalmology, *and* internal medicine.

Health departments learned this lesson long ago. A health officer is hardly expected to be public health nurse, sanitary engineer, statistician, venereal disease and tuberculosis control officer, and maternal and child health specialist—all at once. Public health administration has recognized the importance of team work by a group of especially trained persons. In medical practice, on the other hand, it has taken longer to accept this notion.

But besides the team of special skills, there is also the question of equipment. No single physician could hope to own and use all the apparatus or to retain all the technical assistants these skills must have to be effective. Even if he were a Croesus and could afford all these, sheer lack of time would make it impossible for him to use them more than a fraction of the time—for the most part they would be idle and wasted.

Complete preventive medicine, then, requires all the elements now recognized as required for medical care. This means that physicians of different general and special skills need to pool these skills for their patients' benefit, using in common the necessary equip-



ment and assisting personnel. A technique for accomplishing this, group medical practice, originated in the United States half a century ago at such famous centers as the Mayo Clinic, and has gained wide acceptance in recent years. In group practice, the various techniques essential for examining, diagnosing, and treating individuals are brought together in a team, making easily accessible the refinements needed if prevention is really to be practised.

Furthermore, group practice, through the pooling of income and expenditures, makes possible great economies in time, skill, and equipment. Younger physicians entering a group can immediately be fully occupied in accordance with their abilities, under the supervision of the senior members of the group, instead of spending one-third to one-half of their time waiting, in isolation, for patients to come to them. It means that the physician of the group can call upon consultants and laboratory services as frequently as he needs them with great professional advantage to himself and his patients, and without economic loss to him—because the group as a whole gains from every service performed by any of its members. It means, moreover, that the cost of expensive equipment and of highly trained technical personnel is shared by the whole group rather than being borne by a single physician. Finally, the group can make use of its equipment and personnel to the fullest advantage, keeping them occupied at capacity levels.

Through group practice, therefore, the potentialities of modern medicine for prevention can best be fully realized. It should be made clear that group practice should and can be so organized that the personal relationship between patient and physician is maintained and, indeed, enhanced. The patient of a group is actually under the general care and supervision of one

physician who becomes that patient's personal doctor in as full a sense as could any individual practitioner. But this family physician, new-style, has the specialists and laboratories of the group to aid him, while he retains general supervision of the case. Thus the patient's personal physician in a group is the key man of a medical team combining the intimate knowledge and appreciation of the family doctor with the most highly developed scientific skills of his colleagues—skills which are beyond the reach of the individual family physician, old-style. This medical team makes possible the best preventive medicine because the family physician's knowledge of the personal, social, occupational, emotional, as well as physiological circumstances of his patient can thus be utilized in coördination with the special techniques of other members of the team, including those of the nurse, the social worker, the dietician, and the health educator, as well as the physician, to study and promote the health and well-being of the patient, to prevent the spread of illness, to diagnose and treat it early and to mitigate its disabling effects.

#### PREPAYMENT FOR MEDICAL CARE

But no story of group practice in preventive medicine is complete unless we consider how the preventive benefits of group practice can be made accessible to the patient. Although group practice is economical, the costs of complete modern medical care remain high in relation to the average pocketbook. Much of the potential value of medical science for preventive medicine is lost today because under the fee-for-service system of payment, people do not go to the physician—or the medical group—for regular examination, and for early diagnosis and treatment. Illness, and, with fee-for-service payment, the costs of illness, are unpredictable for the in-

dividual and, consequently, budgeting for health becomes impossible. In any one year, the unevenness with which illness strikes results, under the fee-for-service system, in almost half of the nation's total medical bill being borne by about 10 per cent of the people—and this, of course the 10 per cent who happen to be ill that year and can therefore least well afford to pay.

If medicine is really to serve people for preventive purposes, it must be made accessible to them through methods of payment which will encourage early and full use of comprehensive service. This is only possible through prepayment, or insurance, for medical service. Insurance for the costs of surgery and obstetrics or other limited services is helpful in meeting the costs of catastrophic illness, but it is almost useless as a preventive measure.

The real possibilities of preventive medicine can be achieved only through group medical practice combined with insurance for comprehensive service. This combination has proved to be successful in numerous instances in industrial organizations like the Northern Pacific Railroad, whose plan was founded in 1882 and is still operating successfully, in private groups like the Trinity Hospital of Little Rock, Ark.; and in coöperative plans like the Farmers Union Hospital in Elk City, Okla. These and many other similar examples have shown that insurance for comprehensive medical service can be professionally and economically successful when physicians are organized in groups and are paid according to their time and skill, rather than by fees-for-service. If the possibilities for prevention are to be fully realized, of course, "comprehensive service" must include not only physicians' and hospital services, but dental and nursing care, drugs, and appliances as well.

#### · RÔLE OF PUBLIC HEALTH PROFESSION

Preventive medicine, viewed in this light, is a large order, but it is one which people generally, aware of the scientific achievements of medicine, have begun to recognize as what they want to have and to pay for, as their means permit, just as they want other more general measures which conduce toward positive health, like housing, recreation, nutrition, education, and a decent standard of living. The public health profession, dedicated to the prevention of disease and the promotion of health, is therefore obligated, together with the medical, dental, nursing, and other health professions, to take the initiative in meeting this demand, to assist the community to obtain preventive medicine in its fullest sense, for all of its people. Many difficulties are to be overcome, as we have found in our attempt to solve these problems in the Health Insurance Plan of Greater New York, but they are not insurmountable. Complete preventive medicine can become a reality for all. This will require, however, not merely the best efforts of the health professions, but the combined energies of all sections of the community: of business, labor, agriculture, government, and the professions. For preventive medicine and achievement of positive health are problems not simply for sanitary engineers and doctors and nurses and dentists. They are the natural concern of every person. Everyone's health is what is at stake, after all. If preventive medicine means anything it means not only the prevention of the communication of disease (and even here the physician must take the first steps toward prevention), but also the prevention of the sequelae, the prevention of unnecessary handicaps and disability, and the prevention of emotional disturbances and their results. So it is fair to say that this kind of preventive medicine is a challenge to us all. Upon our success,

then, in leading the community to organize modern medical skills into teams for the people's benefit, and upon our ability and willingness to assist in making these skills accessible to all through prepayment for comprehensive service will depend the prospects of better health for the American people.

---

## Progress in World-Wide Coöperation in Public Health

The Interim Commission of the World Health Organization recently reported gains made in the past year. Seven major steps relating to world health have been taken:

1. Adoption by the International Health Conference, convened in New York, of the World Health Organization Constitution.
2. Establishment of an interim commission for giving emergency public health aid to certain war torn countries.
3. Transfer of the health functions of the

League of Nations to the World Health Organization's Interim Commission.

4. Transfer of the epidemiological information service of UNRRA to the Interim Commission.

5. Transfer from UNRRA of emergency field assistance in certain areas.

6. Authorization of six technical committees dealing with yellow fever, malaria, narcotics and other subjects of primary public health importance.

7. Institution of a fellowship program for study in the United States, Canada, and other countries of specialists in public health, sanitary engineering and medicine.

# The Health Department and Medical Care\*

## Certain Trends

JOHN B. GRANT, M.D., F.A.P.H.A.

*The International Health Division, Rockefeller Foundation, New York, N. Y.*

IN his recent *Medical Education and the Changing Order*,<sup>1</sup> Allen states: "Medicine is coming of age as a social science in the service of society." The three previous papers in this session imply that health departments which largely have stabilized administration for the hygiene of the environment, the control of communicable disease, the organization of medical and nursing service for the early diagnosis and preventive treatment of disease in the individual, and to a lesser extent the education of the individual in principles of personal hygiene and of preventive medicine, are now evolving toward their ultimate responsibility. This is the promotion of positive health for each individual to achieve and maintain optimum health of mind and body. As such, public health is indeed a field of social service. One of the chief factors in reaching this end will be the extent to which health workers see their responsibility to establish the *organization* required to *distribute* good medical care.

### ADMINISTRATIVE PRINCIPLES

The eventual effectiveness of public health progress is determined by the soundness of the principles upon which its administration is based. Since the first World War principles have been

enunciated in many countries, including the United States. The following three derived from English experience appear to be the most significant.

1. The Magna Carta of administrative principles was enunciated by the British Ministry of Reconstruction in 1919 and led to the establishment of the Ministry of Health:

The first principle of good administration requires that when a special function is to be undertaken, it shall be undertaken by one governing body for the whole community needing the service, and not for different sections of the community by several governing bodies.

2. The Interim Report, on the Future Provision of Medical and Allied Services<sup>2</sup> said:

Preventive and curative medicine cannot be separated on any sound principle, and in any scheme of medical services must be brought together in close coördination. They must likewise be both brought within the sphere of the general practitioner, whose duties should embrace the work of communal as well as individual medicine.

3. More recently the Interdepartmental Committee on Medical Schools<sup>3</sup> stated:

The first step in the experimentation and demonstration of progress in new forms of medical service is its establishment by the teaching hospitals.

Trends particularly in Scandinavia and the British Commonwealth are toward fulfillment of these three principles under the guidance of public health administration.

\* Presented at a Special Session of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 12, 1946.

The United States is the only industrialized country in which the above principles continue to be largely ignored. The multiplicity of authorities at both federal and state levels which have health and medical responsibilities is so well known as to require no elaboration. Public health and curative medicine are almost always under separate administrations, and as yet the Association of American Medical Colleges has given no indication of any interest in the responsibility of the teaching center for progress in establishing new forms of medical service.

The achievement of health departments in controlling sanitation of the environment and the incidence of communicable diseases with the consequent improvement in mortality rates has already resulted in the well known marked shifts in the age distribution of population and has disclosed the three major lags in medical care; namely, rehabilitation, chronic illness, and mental care. Each of these, to a greater or lesser extent, is the concern of the health authorities, but hitherto this has been fragmentary and inefficient. At both federal and state levels, the care of the chronic sick is limited to recipients of public assistance and is the administrative concern of welfare rather than health authorities. Rehabilitation at the federal level comes under the Office of Vocational Rehabilitation, and at the state level it is the concern of medical authorities, but is divided between education and welfare. Mental care at the federal level is a public health responsibility, but at the state level responsibility is distributed between welfare and special mental administrations. Further examples could be enumerated of violations of the first fundamental principle quoted above that good health administration requires that all health functions in the community shall be undertaken by one governing body and not for different

sections of the community by several governing bodies.

This chaotic situation has been partly, although not wholly, due to the belief that the addition to limited public health activities of hospital administration which has larger budgets would swamp "public health" which would be the first to suffer in any retrenchment. There were undoubtedly some grounds for this view in the past, but these will be found increasingly untenable in the future. Once the essential environmental and infectious disease services have been completed, health will not further progress satisfactorily until preventive and curative medicine are brought under a single coördinated administration which includes the general practitioner (along the lines to be described for Schoharie County). This is a shared responsibility: education on the one hand should assure the competency of the medical personnel, and public health administration on the other hand should assure the organization for efficient distribution.

The previous papers indicate that initial steps to improve the present situation are being considered. The reasons for this trend become obvious when one envisages forthcoming medical practice with the present emphasis on diagnosis and therapy overshadowed by emphasis on rehabilitation and on positive health. The British Medical Association and the Canadian Public Health Association have declared that the family rather than the individual should hereafter be the unit of the general practitioner. The recently enacted English National Health Services Act, 1946, emphasizes preventive medicine as logically an integral part of curative medicine by transferring from the health authorities to the general practitioner responsibility for the professional aspects of personal health services, such as maternity and child health. In the

United States these must necessarily continue the responsibility of health authorities in the absence of prepayment for medical services, which in England have now been extended to the population as a whole. The Act furthermore accepts the recommendation of the Goodenough Report that medical schools and their hospitals become partners in the national health service. Medical education in England is consequently in the process of thorough reorganization in acknowledgment of the thesis put forward in the Goodenough Report that "Properly planned and carefully conducted medical education is the essential foundation of a comprehensive health service."

The unit of organization in this projected reorganization of the British national system of undergraduate medical education is a medical teaching center consisting of a university medical school, a group of teaching hospitals (parent-associated), and such clinics of the health service of the district as are needed for teaching purposes. In deciding the importance to be attached to various subjects and the type of instruction, the educational reforms are directed toward the needs of the future general practitioner. Special importance is laid on the prevention of disease and an appreciation of the part played by social environment in health and sickness, diagnosis of acute medical and surgical conditions, child health and infectious diseases, the recognition of emergency and of malignant diseases, the milder forms of mental and nervous disturbance, minor ailments, chronic sickness, and rehabilitation. It is because the preventive and social aspects of such training can be given only in the community that health centers are being provided as an integral part of the system of undergraduate medical education. In brief, the principle underlying the recent U. S. Public Health Service *Bulletin* 292 on "Health Service

Areas"<sup>4</sup> has now become legislation in Great Britain. This increasing integration of the medical school with the health needs and medical care activities of its community is the most significant trend today toward raising the level of health.

Reference should be made here to three experimental demonstrations in the United States: that of the Bingham Associates in Boston, the Council of Rochester (N. Y.) Regional Hospitals, and the Michigan Community Health Project. These projects are designed to improve the technological competency of medical personnel and the adequacy of their diagnostic tools. The recently concluded report of the Commission on Hospital Care of the American Hospital Association recommends removing the present sharp separation of preventive and curative medicine to the extent, at least, that health departments should form joint councils with hospitals to effect coördinated programs. The Commission also recommends that health centers should be part of, or adjacent to, strategically located hospitals. It is anticipated that close physical relationship between hospital and health agencies, including volunteer agencies, should help to integrate activities, particularly those of related programs.

#### NEED FOR HEALTH-MINDED LEADERSHIP

These trends very distinctly indicate two things: First, the attainment of a high standard of physical and mental health is largely the eventual responsibility of medical practitioners. Second, public health, having gone so far in the effective control of preventable diseases, should next tackle the problem of making generally available the skilled medical services necessary to maintain and promote mental and physical health. Unless the public health profession realizes this increasing responsibility, it will lose the opportunity of preserving and maintaining

the primacy of preventive medicine. To maintain balance in organization for the distribution of medical care and to assure its promotion of positive mental and physical health, it is necessary to have at the top health-minded rather than disease-minded persons. Naturally, clinicians must have full responsibility in clinical fields, and hospital administrators have full responsibility for hospital administration; but in the whole scheme of things, it is the health officer rather than the hospital officer who should plan, and who, at the top, should have the last word in advising on allocation of resources. Otherwise, public hospitals will become autonomous medical departments, with uncontrolled vested interest in curative medicine, that is to say, disease. Disease is negative and unproductive. It is in the interest of society to limit so far as possible all vested interests in social activities that are negative and unproductive in subject.

The recent passage of the Hill-Burton Act to give aid in adequate provision of hospitals and health centers, and the rapid increase in prepayment medical care plans make it desirable to define some of these commonly accepted terms for the sake of clarity in thinking. (1) *Adequate medical care* makes available to the community without discrimination all facilities of medical science necessary for the individual to achieve and maintain optimum health of mind and body. (2) Health of mind and body is a basic human need; a healthful community is a basic social need. *Public health* has as its aim the meeting of these needs. The program should not only include curative and preventive measures for the protection of the individual and the community against whatever interferes with the full development and maintenance of man's mental and physical capacity, but should go beyond these to the promotion of positive health through appli-

cation of sociological concepts and methods to the problems of health and disease. The October, 1945, *Newsletter* of the Commission on Hospital Care defines: "*Health centers* would provide facilities for health officer, nurse, sanitarian, physician, certain diagnostic services, and a few hospital beds for patients who could not readily be transported to larger centers or who would not require the services of specialists."

Tax units throughout the country are increasingly combining health administration and hospital care. This has already been done in California and Massachusetts and is planned for New York State. Unless the public health profession realizes its opportunity and responsibility, there is a real danger of community health being run by hospital administrators limited to a disease outlook.

Reference has already been made to the Bingham Associates, the Council of Rochester Regional Hospitals, and the Michigan Community Health Project. These plans call for an affiliation between the medical center and regional and community hospitals. The Rochester project is at too early a stage to permit comment, but the other two plans so far have been concerned predominantly with disease rather than with health, that is, training graduates in "diagnosis and therapy" of disease without any discernible concern with either rehabilitation or promotion of positive health. The direction of both the Bingham and Michigan plans is under clinicians. A possible reason for this exclusive concern may lie in the fact that planning is from the base hospital and center toward the community, rather than from the community, building up gradually in terms of needs, to the base.

As peripheral tax units administratively combine hospitals and medical care, there should also be integration

with the local health administration as already suggested. The most carefully designed proposal for this integration may be found in New York State. *The Schoharie County Health Service* (July, 1946) in the relationship between the rural hospital and the public health service states as its underlying principle, "It appears apparent that only through a program of combined action can there be an adequate service developed for the base of many of the more sparsely settled sections of the country." The plan makes the following proposals: The hospital is to be operated either as part of or in close coördination with the county health department and under the administration of the county health officer, who should have had experience or a short period of training in hospital administration. The hospital, in addition to providing space for the health department, is to provide offices for certain practitioners, particularly the surgeon, internist, and the pathologist, and roentgenologist on a part-time basis. The services of the part-time specialists, together with such other consultative services as may be required, will be in association with the Albany Medical Center. The nursing service of the hospital, its out-patients, and the field nursing service of the health department are to be coördinated through a joint plan by the hospital and health departments for the referral of patients, transfer of records, etc., to provide continuity of nursing care in accordance with patients' needs. The hospital is also to house the public health laboratory service. The United States is greatly in need of carefully planned regional experiments along this line to build up the experience required to plan for the needs of adequate medical care from the periphery to the base. However, the medical care will not be adequate in terms of our definition, unless the individual responsible for plan-

ning is health conscious rather than disease-minded.

Another development which may prove of national significance is the Maryland medical care program developing under the State Board of Health. This is the first state board to administer medical services to the indigent and medically indigent. Administration is decentralized under the county health departments with advisory councils. The significant features are the state-wide provision of clinical diagnostic services and, more particularly, the proposed consultation service with active participation of The Johns Hopkins University and the University of Maryland, which, in effect, would evolve into a program similar to that of the Bingham Associates *but* administered not by hospitals or a medical school but by the health department.

Hitherto the health services have assumed responsibility for "personal health services" because of their essential part in the prevention of disease. The general practitioner has in the main not undertaken preventive measures for two reasons: First, the exclusive emphasis in his training in diagnosis and therapy has not prepared him to undertake these preventive services, although rationally these should be as important a part of clinical medicine as diagnosis and therapy. This situation is gradually changing in obstetrics and particularly in pediatrics, but should be extended to all clinical medicine and should include rehabilitation and the application of knowledge of the social and economic factors concerned with health and disease. The second reason is fee-for-service, and the consequent economic deterrent on the community to seek preventive medical care. The recent separation in England of personal health services from health administration as such is rational and eventually will be universal, with the general practitioner



undertaking all required preventive medicine. This will require considerable reorientation of undergraduate medical education with respect to the teaching of preventive and social medicine. Similarly there must be a renewed reorientation in the training of public health personnel, particularly the health officer.

A major reason for the hesitancy of the health officer in the United States to assume administrative responsibility for medical care, including hospital administration—a hesitancy which does not obtain in any other English speaking country—is the lack of leadership in the schools of public health to foresee the future and to train the future leaders of the country in their responsibilities toward medical care administration. The health officer should have the same basic knowledge of medical care administration, including hospital administration, as he has had opportunity in the past to acquire in biostatistics and public health microbiology. Due chiefly to the help of the Kellogg Foundation, there are now six universities (three schools of public health) either offering or in process of establishing courses in hospital administration. In the current academic year 201\* students are registered this academic year in the five schools already operating. The courses lead to a diploma or certificate. The balance of the field of medical care administration is practically ignored even in schools of public health. It is of interest to note that the London School of Hygiene is in process of reorganization, whereby one of its three major interests will be medical care administration. Only two of the schools in North America are in a position to offer even a major elective in the M.P.H., and then only in the economic aspects of medical care administration. It is

natural that health officers are hesitant to undertake the responsibility of medical care administration in advance of opportunity for training in the art of medical care.

Schools of public health should immediately inaugurate major departments of medical care administration, including medical economics and hospital administration. Training can more effectively be undertaken if the schools are in universities with a medical college associated organically with the community and district health centers and hospitals of the area in the manner already described. Similarly, the closer the department can be associated with the administration of prepayment hospital and medical service plans in the area, the more effective it will be. Investigation should be as important a responsibility as teaching. Such investigation would determine methods and techniques of promoting positive health on the one hand and, on the other, explore the most effective administrative methods and techniques for the distribution of medical care. Naturally, the closer the department is associated with the administration of medical care plans, the greater the opportunity for controlled investigation. Mere access to prepayment plans not controlled by the teaching department will prove unsatisfactory if only for the reason that in general this will mean access to inadequate medical care which the department will be unable to correct in terms of the principles it is teaching. Such association of academic departments to control teaching and investigative facilities has long been considered a necessity for pre-clinical and clinical medicine. It is no less a necessity for medical care administration.

#### SUMMARY

The United States is rapidly laying the foundation for a vast extension of medical care and health services. The

\* One hundred and forty-two at Northwestern.

expansion of these services must be undertaken by a single administrative body for the whole community, not by several governing bodies. If adequate medical care is to be attained, particularly in its health aspects, this body should be public health administration. Health departments can ill afford to ignore the outstanding world trend in the organization of medical care and health services which is the regionalization of hospitals and their interrelation in each area in a unified plan to provide a two-way flow between the center and periphery for better medical care facilities, as well as for training and research.

It is now twenty years since Professor Winslow gave his presidential address, "Public Health at the Crossroads."<sup>5</sup> In this statesmanlike discussion of the major problems of the Association for the succeeding fifty years he said: "The attempt to fix the boundaries of the public health program by establishing a distinction between prevention and cure must lead only to confusion and incertitude," and he called attention to the problem of making medical service really preven-

tive and not an attempted alleviation after the event. His summary challenged the health officer of the future to undertake the lead in governing the form and direction which inevitable extension of medical care would take during the succeeding twenty years. These twenty years have now transpired. The profession is even more at the crossroads today, because of the parting of the ways which will determine whether or not the primacy of preventive medicine is to be maintained by having health-minded, rather than disease-minded, persons responsible for overall planning and the direction and allocation of community resources. We should realize and seize this opportunity.

#### REFERENCES

1. Allen, Raymond B. *Medical Education and the Changing Order*. New York: Commonwealth Fund, 1946.
2. Ministry of Health. Consultative Council on Medical and Allied Services, *Interim Report on the Future Provision of Medical and Allied Services*, London, 1920.
3. Ministry of Health. *Report of the Interdepartmental Committee on Medical Schools* (W. E. Goodenough, chairman), London, 1944. This is often referred to as the Goodenough Report.
4. Mountin, J. W., Pennell, E. H., and Hoge, V. M. Health Service Areas. *Pub. Health Bull* 292, U. S. Public Health Service, 1945.
5. Winslow, C.-E. A. Public Health at the Crossroads. *A.J.P.H.*, 16:1075-1085 (Nov.), 1926.

## Discussion of Papers on The Health Department and Medical Care

C.-E. A. WINSLOW, DR.P.H., F.A.P.H.A.

*Editor, American Journal of Public Health, and Emeritus Professor of Public Health, Yale University, New Haven, Conn.*

DR. GRANT made a more than gracious reference to my Presidential address of twenty years ago. I deeply appreciate it. In discussing these papers, however, I do not wish to penetrate quite so far into the dim ages of the past; I want to go back only fourteen years to the report of the Committee on the Cost of Medical Care adopted in October, 1932.

That report recommended a policy of medical care embodying two general principles: the provision of such care "largely by organized groups of physicians, dentists, nurses, pharmacists, and other personnel . . . preferably organized around a hospital for rendering complete home, office, and hospital care"; and distribution of the cost of medical care "on a group payment

basis through the use of insurance, through the use of taxation, or through the use of both these methods." The committee specifically avoided recommending compulsory insurance at that time, but suggested gradual experimentation along the general lines laid down above. The principles outlined have now met with reasonably general acceptance. The gradual experimentation which we hoped might point the way, has, however, been long delayed, chiefly because the *Journal of the American Medical Association* denounced our proposals as "socialism and Bolshevism, inciting to revolution."

Today, however, such experiments as we visualized are being made and three such experiments of major importance have been described in the preceding papers.

The Maryland Plan attacks one sector of the general area of chaos in an interesting and promising fashion. It deals only with the care of the indigent and semi-indigent but this is at least a step in the right direction. There used to be a common slogan to the effect that "only the very rich and the very poor get good medical care." This was better than most slogans in so far as it was half true. In the past only the very rich received good medical care, but in Maryland the very poor are also placed in a privileged position. In one respect I think that the Maryland program is perhaps more a demonstration than an experiment. In experiments we generally start from the basis of well established facts. We do not begin to study the etiology of a disease like epidemic jaundice by first exploring the theory that this disease is caused by miasma. There is a vast body of evidence that any insurance plan based on fee-for-service payment is bound in the end to involve impossibly high cost. I do not, however, question the importance from a psychological standpoint of trying it out again,

and in many respects the experience of Maryland should prove of incalculable value to other areas.

The Health Insurance Plan of Greater New York is an experiment of wide significance and great promise. It is essentially, so far as the insured person is concerned, a compulsory health insurance scheme which is non-compulsory. However, when one realizes that the government of the City of New York and such private industries as join the program will pay approximately half the cost of medical care for the insured person and his family, it would be a rare individual who did not feel a self-compulsion to join. This program too, of course, covers only one section of the community, although potentially a major section. Many industrial firms will fail to participate and their employees and the self-employed will no doubt desire a similar program for themselves. It is of the greatest interest that the plan is based on group practice, and it is a fine tribute to the statesmanship of Dr. George Baehr that this program was adopted by the consent of the county medical societies. These societies first asked for a fee-for-service basis and individual practice. This proposal was accepted by the proponents of the program *but* only on condition that the county medical society should undertake to police the plan and keep its cost within limits. After months of conference, both sides agreed to group practice and capitation payments.

Dr. Jackson has told you of a wider program in Manitoba and Dr. Grant has given you a picture of world-wide trends in the same direction. I think it may be considered certain that in the United States, as in other countries, we must ultimately meet the demand that complete medical care, of the highest quality available in a given area, shall be accessible to all citizens and on terms compatible with their self-respect.

I agree with those who have urged a responsibility of the health officer in this vital health issue of the next decade. It is by no means necessary that he shall furnish medical care. The wise administrator is the one who "let's George do it" whenever "George" can perform adequately. The health officer is, however, the one individual who has direct responsibility to the community for all aspects of the health of the people, and it is his duty to see that in some fashion the ends outlined above are attained.

I agree with Dr. Grant that our schools of public health are not doing their duty adequately in connection with this vital responsibility of the community health administrator. It happens to be my privilege as consultant to the Committee on Professional Education of the American Public Health Association to visit and study the schools of public health. In nine schools which I visited last year there were thirty-five faculty members of professorial or associate professorial grade in the field which deals with microbiology, immunology, and epidemiology. One school only (Michigan) had a full-time faculty member to cover the field of social and economic factors in disease. These factors in a country like the United States are far more important than those which relate

to the spread of epidemic disease. I must, however, call attention to the fact that the schools of public health are struggling with a vast task and in all but two or three instances with relatively meager resources.

The papers which have been read here and the discussion which has followed are constructive and significant. We have a long way to go but we are on our way. The logic of facts is with us. I have learned through some years of experience that ultimately the thing that is logical and right will come to pass. The public is year by year getting a clearer idea of what good medical care may mean and it is more and more determined that such care shall be made available to all. Let me remind you of a tale which Professor Frank Graham of the University of North Carolina used to tell. He had a summer place on the seashore on very low land. He was there one weekend during a storm which produced almost a tidal wave, rising almost to the windowsills of the cottage. His colored cook was frightened, and he tried to reassure her by saying that he thought the water was going down. She replied, "Massa Frank, it ain't them three feet of water outside the window that I is a'feared of, it's the 3,000 miles of water that's leanin' up against it."

# Today's Key to Better Public Health Service\*

WILLIAM P. SHEPARD, M.D., F.A.P.H.A., AND  
REGINALD M. ATWATER, M.D., F.A.P.H.A.

*Metropolitan Life Insurance Company, San Francisco, Calif.; and Executive Secretary, American Public Health Association, New York, N. Y.*

AT a recent symposium of state health officers and directors of local health service it was agreed that our most critical public health problem today lies in the shortage of trained personnel. Never before has there been such a demand for public health staff; never before such ambitious programs waiting to move forward; never so much agreement as to where the next steps should lead. But all of this is only frustrating when the men and women cannot be found.

At this moment there are on record with the American Public Health Association more than 800 openings of the better kind for doctors, engineers, health educators, laboratory directors, statisticians, industrial hygienists, public health dentists, school physicians, sanitarians, and others. We have listed fewer than 100 persons available to meet these urgent demands. There are very few other candidates available in the market. Even these country-wide listings do not exhaust the actual and potential vacancies which can easily be uncovered by talking to any public health administrator.

This represents a truly unprecedented situation. The ten schools accredited by the Association for the M.P.H. de-

gree are operating almost to capacity. There are about 500 enrolled for the M.P.H. courses and almost as many enrolled for other degrees and as special students. One would think that this gave promise of some relief by the time these trainees are through their courses. But the fact is that most of these individuals are already engaged in some public health capacity and will return to their assignments. Very few are available to meet the demand reflected in these figures.

There is little need for further documentation of this shortage which is known to all. It is imperative to look beneath the surface and to discover why careers in public health, which in the past have brought out some of the most able men and women, are today less sought after. Even ten years ago in the United States there was a distinct surplus of well trained persons with public health experience ready to take career positions. That reserve is nonexistent now. Shifting of experienced persons from one area to another does not alter the fact that the demand greatly exceeds the supply.

It was manifest at the recent National Conference on Local Health Units that state health officers and their directors of local health service believed that our inability to recruit professional personnel was the most difficult single obstacle to the extension of public health services. They went further to state that the most

---

\* Presented before the Health Officers Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 12, 1946.

serious handicap in recruiting personnel was the unfavorable position of public health salaries compared with other professions requiring comparable education and training and compared with other positions open to persons trained in public health.

To come directly to the point, we need only to compare salary trends for various types of public health workers with recent increases in the cost of living to understand the situation. We are indebted to the State of Louisiana for charts showing that recent salary increases for different types of public health work average far less than the increase in cost of living. They also average less than the increases in farm wages, in manufacturing wages and, of course, are much less than the income increases of private physicians, engineers, and others at work in these communities.

A recent study made for the Committee on Postwar training of Public Health Personnel of the U. S. Public Health Service by Dr. George T. Palmer showed the mean of salaries for full-time physicians in state health departments to be only \$5,100 per year. The range was from a minimum of \$3,000 to a maximum of \$12,000 (in one instance). As long ago as 1943, *Medical Economics* found in a sampling of about 5,000 doctors that the average practising physician's net income was \$8,700 a year with a gross of \$13,600. It is now much higher, of course. We have long known that public health engineers were paid far less than their colleagues in other engineering fields, despite the fact that their training often exceeds that of civil, mechanical, and electrical engineers. Only recently, and then only in a few places, has the additional training of the public health nurse been recognized by slightly higher compensation. It is a notable fact that among public health workers as a whole the largest percentage increases have been to clerical

and technical personnel, and the lowest rates of increase to the professional classes.

It is obvious then, that public health workers are underpaid. This situation has arisen during a time when more than ever before there has been an increasing demand for high standards of training and experience. The health officer who seeks employment today on a career basis must offer far more than graduation from medical school and internship in a hospital. To fill a responsible position in most cases he will be required to present a Master's degree in public health, or its equivalent, representing not less than one year in residence at an institution equipped to give postgraduate courses in this field and a substantial amount of full-time experience under supervision. Physicians who wish to direct maternal and child health, mental hygiene, and cancer control programs may need as much as three years' graduate training after the internship. The public health nurse to qualify for the better positions needs to complete a year's course in an institution accredited for this purpose and have several years' experience. The demand for engineers with Masters' degrees in public health is definitely increased, and so it goes for other types of workers. The kind of education and practical experience that a young person needs to qualify himself has become generally accepted as evidenced by the American Public Health Association approval of some fifteen reports on desirable educational qualifications for the different categories of public health workers.

We believe you will agree with our conviction that, from this point on, energy which we spend in raising salary standards will do more to increase the number and improve the performance of public health workers than anything else we can do. Good personnel practices are important too and we shall continue and expand our studies in this

field through the Merit System Unit.

It is a fact that there is a linkage between the money income of a profession and its prestige. If public health is to demand from the physician, for example, a graduate and postgraduate training that requires as much competence and as long a preparation as that for the various specialties of medical practice, then in the long run the community must compensate the physician in public service in approximately the same way as the private practitioner. Failure to do so leads to the inevitable consequence of getting second quality physicians.

It seems to be true that most scientists—and public health scientists are no exception—are a notoriously modest lot. The professional worker has not been accustomed to parading his claims for higher compensation. Indeed, strict barriers of law and regulation are set up to prevent the degrading of the profession by such devices as advertising, which is an acceptable practice in most other fields. Now the time has come when professions without a clear recognition of the parallelism between adequate compensation and good service are taking the consequence of a pattern developed in a very different day.

Among the more than 10,000 members of the American Public Health Association approximately 36 per cent are graduates in medicine; other specialties in public health are the product of disciplines which similarly make abhorrent any suggestion of self advertising and of bragging in the market place of the achievements of their profession. We believe it to be self evident that this professional reticence has prevented the recognition of the true worth of the public health scientist in frank terms of money and the value of his services to the public in dollars and cents. Since none will speak for himself, we believe it to be a function of the public health worker's professional society to speak for him, and by every means in its power

to create public and legislative attitudes favorable to him. In so doing the man in the street will get better public health service.

What is the value of a health officer to a community? So far as we know there has yet to be computed the real money value of such a public servant to a community when he conserves the community human assets. If, however, one takes the decline in deaths from even the most obvious causes and computes the conservation of human resources by multiplying this number of saved lives by the worth of the man as computed by Dublin, there is a very high resulting value of the health officer in dollars and cents accruing to the community.

For example, in Great Britain in recent months it is reliably estimated that effective methods for the control of cerebrospinal meningitis among the civilian population have saved 15,000 lives. Even if the doctors and nurses and epidemiologists who accomplished this result, in coöperation with the private physicians, contributed nothing else to the welfare of Great Britain, they have made an astounding saving of material as well as human resources, especially during the critical wartime days when man power was at such a premium.

To be sure, those who contribute to the public welfare through preventive medicine work against a serious handicap in being unable to give the name and address of the person who did *not* acquire this or that disease because of successful preventive measures. The activities of these health men are characteristically unheralded and largely unknown to the public. The persistent supervision, for example, that a public health engineer will give to a municipal pasteurizing system, preventing the outbreak of milk-borne disease, suffers in dramatic comparison with the activities of practitioners who cut and dose their

patients. The extra effort that the public health nurse may make at the end of a long day to uncover a fresh case of syphilis in a promiscuous person may represent a contribution to the public welfare entirely out of proportion to the salary which she is paid. When followed through with curative procedures, this action may well prevent the birth of babies with congenital syphilis and the long continued custodial care of those who otherwise would have the central nervous system complications of this disease.

In short, we believe it is poor business and false economy on a national scale for the salaries of public health workers to remain low in comparison with the incomes of similarly trained servants of the public with whom there is an inescapable competition for top quality leadership. In our society at the present time the money rewards of those in business and industry are proportionately so great and are increasing with such rapidity that the individual with a public service motive finds himself at a distinct disadvantage. The notable increases in public income and the increasingly generous public response to national appeals for voluntary health agency work are reflected to only a slight degree in the compensation of the workers without whom these programs cannot succeed.

As we look ahead to the kind of world our children will live in, it is plain that we want our public services in the schools and in the health departments staffed by professionally adequate persons, attracted to their positions on a career basis and held there by a hard-earned professional competence. They need a firm conviction that their job is worth while and that it is appreciated. This can only be brought about by adequate compensation. If we can achieve these goals we can know for a fact that the educational and health status of our children and grandchildren will be far

better than if it is assumed that these services will be staffed only with those of second or third grade quality.

There already is a ferment at work on all sides in the service professions that demands quite vocally reasonable rates of pay. Teachers and social workers and some other professional groups are beginning to be unionized. We believe that the professional societies can accomplish better public support for their members than can trade unions, without the sacrifice of the professional ideals which we value so highly.

Difficult working conditions and inferior pay scales which have made words and phrases like "inequities," "equal pay for equal work," "fair employment, practices," etc., widely understood in other groups in the population, also exist among professional groups and must be realistically faced.

We believe that the use of wise compensation plans by the public as instruments of personnel management can result in correcting much of this deplorable situation. We believe that the federal agencies have been wise in urging state and local compensation plans which meet the test of good procedure. We believe with Mountin and his co-workers that these compensation plans should provide a recognition of the principle of equal pay for equal work; a fair adjustment of the salary range to the responsibility and difficulty of the work expected; a realistic recognition of prevailing wage levels for similar work in private industry and other public agencies in the locality, and recognition of the economic law of supply and demand in relation to current labor markets.

We now are seeing the operation of a very short-sighted public policy which in several states freezes compensation levels at figures long out of step with the current market value of the services. The penalty, of course, is that competent persons with training and experi-



ence are drained out of these areas of inadequate salaries into better paying areas.

The situation which has been so well dramatized in the shortage of teachers and of student nurses is facing public authorities and appropriating bodies in other respects and workers in the field of public health must not be overlooked.

The Committee on Professional Education of the American Public Health Association, after long dealing with this subject, has been advised by the Governing Council and the Executive Board that it ought to have no embarrassment in presenting, quite objectively, the inherent relationship between good standards and adequate compensation. The committee has begun a serious study of the salary situation. It has been determined that the Association will not spend its effort in putting on record evidence that salaries are below subsistence level in many categories and in many places. Everyone with insight knows that now. The committee has determined at this time that decent salary ranges shall be affirmatively recommended and that the committee will now state publicly the acceptable salary ranges for various types of jobs. This

we believe to be a real challenge to immediate action.

A committee has been appointed under the chairmanship of Dr. Leonard A. Scheele which held its first meeting at the Cleveland session. We believe that no long, detailed, statistical study will be needed. As a start, perhaps all that is required is a report which will bring together broad outlines and put the entire picture into focus for specific recommendations. We bespeak your coöperation with this committee which may call on many of you for assistance. Your professional society; the American Public Health Association, can do more than we as individuals can do and the Committee on Professional Education will provide all the help within its power. Much will depend, however, on the aggressiveness, determination, and persistence with which our recommendations are supported by you who are administratively responsible for the quality and performance of your staffs. Either you and we must represent their best interests or they will be forced to do one of two things. They will either forsake public health to the great detriment of the public, which they are already doing, or they will organize to represent themselves.

# Universal Serologic Reactivity with Lipid Antigens<sup>\*†</sup>

Basis for "False Positives"

REUBEN L. KAHN, Sc.D.

*Serology Laboratory, University Hospital, University of Michigan,  
Ann Arbor, Mich.*

A SEROLOGIC phenomenon with lipid antigens has been observed in this laboratory which has seemed to us unique. It has been observed that lipid antigens that are highly specific in the serology of syphilis may be technically so employed with sera as to give nearly 100 per cent positive reactions without regard to syphilis. These reactions have been referred to as "universal reactions" because they can be elicited in almost all human beings and in animals under a variety of technical conditions. These universal reactions will be briefly considered in this article. Major consideration will be given to a relationship which apparently exists between universal reactions and false positives encountered in the serodiagnosis of syphilis. Data will be presented indicating that false positives have their origin in universal reactions.

## *Universal Serologic Reactions*

It was previously reported from this laboratory<sup>1</sup> that tissue extract antigens can be prepared of such high sensitivity that they give nearly 100 per cent precipitation reactions and, to a somewhat

lesser extent, complement-fixation reactions with sera from non-syphilitic human beings. Present studies indicate that close to 100 per cent precipitation reactions, referred to as universal reactions, can be obtained also with serodiagnostic antigens provided appropriate technical conditions are maintained. The lipid extracts employed in eliciting universal reactions were Kahn standard, Kolmer and cardiolipin antigens.

Table 1 presents universal reactions with ten sera. The deviations from the standard Kahn procedure were that the salt solution used as diluent after the 3 minute shaking period consisted of 0.3 per cent NaCl solution instead of 0.9 per cent, and the tests were read after 24 hours' incubation in the icebox instead of immediately after the addition of diluent. It is evident that nine of the Kahn-negative sera gave positive reactions under the modified conditions, and the tenth serum was positive when sensitized antigen, instead of standard Kahn antigen, was employed. It might be added that these precipitates were found to be dispersible upon the addition of 0.1 ml. amounts of a 5 per cent NaCl solution to the tubes.

Table 2 presents universal reactions with Kolmer antigen. The modified tests were performed at 1° C., employing the usual Kahn serum:antigen ratios and the 3 minute shaking period; but

\* Presented before the Laboratory Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 12, 1946.

† Aided by a grant from the Medical Sciences Branch, Office of Naval Research, Washington.

TABLE 1

*Universal Serologic Reactions with Lipid Antigens  
Employing Kahn-negative Sera*

Serum No.	Standard Kahn Test			Presumptive Test	Modified Tests with 0.3 Per cent NaCl Solu- tion as Diluent and 24 Hours in Icebox			
	Tube 1	Tube 2	Tube 3		Standard Antigen			Sensitized Antigen
					Tube 1	Tube 2	Tube 3	
1	—	—	—	—	4 *	4	4	4
2	—	—	—	—	4	4	4	4
3	—	—	—	—	4	4	4	4
4	—	—	—	—	4	4	4	4
5	—	—	—	—	4	4	4	4
6	—	—	—	—	4	1	—	4
7	—	—	—	—	4	4	4	4
8	—	—	—	—	4	4	4	4
9	—	—	—	—	4	4	4	4
10	—	—	—	—	—	—	—	4

\* In this and in the following tables, 4, 3, 2, and 1 represent degrees of potency of precipitation reactions.

the diluent was omitted. All of the Kahn-negative sera showed precipitation reactions. These were reduced on the addition of diluent.

Table 3 presents universal reactions with cardiolipin and Kahn antigens. When the tests were performed at 1° C. with either antigen, and without shaking, all sera showed some precipitation reactions. After the 3 minute shaking period and the addition of diluent, the reactions became negative.

Table 4 illustrates universal reactions quantitatively. Serial dilutions of Kahn-negative sera were prepared with

0.3 per cent NaCl solution. The dilutions ranged from 1:2.5 to 1:160. Standard Kahn antigen was employed and the tests were carried out according to the Kahn quantitative technique except that 0.3 per cent NaCl solution was employed as diluent and the tests were read after 24 hours' incubation in the icebox. It is evident that wide variations exist in the precipitation results given by the different sera. One serum (No. 3) gave strongly positive results in all the serial dilutions employed.

A characteristic of universal reac-

TABLE 2

*Universal Serologic Reactions with Lipid Antigens  
Employing Kahn-negative Sera with Kolmer Antigen*

Serum No.	Tests Performed at 1° C., Shaken 3 Minutes, With- out Addition of Diluent			The Tests After Addition of Diluent (0.85 Per cent NaCl Solution)		
	Tube 1	Tube 2	Tube 3	Tube 1	Tube 2	Tube 3
1	1	1	3	—	—	2
2	—	—	3	—	—	1
3	3	4	4	—	1	2
4	3	3	3	—	1	1
5	1	4	4	—	2	3
6	1	3	4	—	1	2
7	1	3	3	—	—	2
8	3	4	4	—	1	1
9	2	2	2	—	—	1
10	2	2	2	—	—	1

TABLE 3

*Universal Serologic Reactions with Lipid Antigens  
Employing Kahn-negative Sera with Kahn and Cardiolipin Antigens*

Serum No.	Kahn Antigen						Cardiolipin Antigen					
	Tests Performed at 1° C. Without Shaking			The Tests After 3 Minutes' Shaking and Addition of Diluent *			Tests Performed at 1° C. Without Shaking			The Tests After 3 Minutes' Shaking and Addition of Diluent *		
	Tubes			Tubes			Tubes			Tubes		
	1	2	3	1	2	3	1	2	3	1	2	3
1	3	3	4	—	—	—	4	4	4	—	—	—
2	3	3	4	—	—	—	4	4	4	—	—	—
3	4	4	4	—	—	—	4	4	4	—	1	1
4	3	3	3	—	—	—	3	3	3	—	—	—
5	3	3	2	—	—	—	3	3	3	—	—	—
6	4	3	2	—	—	—	4	4	3	—	—	—
7	4	3	3	—	—	—	4	4	3	—	—	—
8	3	2	1	—	—	—	4	3	2	—	—	—
9	1	—	—	—	—	—	3	3	1	—	—	—
10	1	1	—	—	—	—	3	3	3	—	—	—

\* 0.9 per cent NaCl solution.

TABLE 4

*Universal Serologic Reactions with Lipid Antigens  
Quantitative Tests with Kahn-negative Sera. Diluent 0.3 Per cent NaCl Solution and  
24 Hours in Icebox*

Serum No.	Serum Diluted With 0.3 Per cent NaCl Solution						
	1:2.5	1:5	1:10	1:20	1:40	1:80	1:160
1	4	4	4	3	2	—	—
2	4	4	4	4	2	—	—
3	4	4	4	4	4	4	4
4	4	3	1	—	—	—	—
5	4	4	2	1	—	—	—
6	4	4	4	1	—	—	—
7	4	2	2	1	—	—	—
8	4	2	1	—	—	—	—
9	4	4	4	4	4	2	1
10	4	4	4	3	2	1	—

tions is the dispersibility of the precipitates by strong NaCl concentration. As already indicated, 0.1 ml. amounts of 5 per cent (or higher) NaCl solution added to the precipitates will generally cause their dispersion within a few minutes.

*Certain Optimal Technical Conditions  
for Eliciting Universal Reactions  
Are Optimal Also for Eliciting  
False Positives*

The data presented above indicate that positive reactions with non-syphilitic sera can be brought about by the use of different technical steps and with different antigens ordinarily used

in the serology of syphilis. A technical step common to the tests listed in Tables 1-4 is the use of cold temperature, either in the performance of the tests or in their incubation. Another technical step which favors universal reactions is low NaCl concentration in the precipitation system. Also common to the universal reactions listed is the dispersibility of the precipitates in strong salt solution.

These three features form the basis of the verification test devised in this laboratory as an aid in the detection of false positives.<sup>2</sup> When sera giving these positives are examined with the differential temperature technique of

TABLE 5

*Typical False Positive Reactions**Characteristics: Increased Reactivity at Low Temperature and Dispersibility of the Precipitates*

Serum No.	Standard Kahn Test						Precipitation at											
	First Reading Tubes			Second Reading *			1° C.						37° C.					
							First Reading Tubes			Second Reading *			First Reading Tubes			Second Reading *		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
1	—	4	4	—	—	—	4	4	4	—	—	—	—	—	4	—	—	—
2	—	2	4	—	—	—	4	4	4	—	—	—	—	—	3	—	—	—
3	—	—	2	—	—	—	—	4	4	—	—	—	—	—	—	—	—	—
4	—	—	4	—	—	—	2	4	4	—	—	—	—	—	1	—	—	—
5	—	1	3	—	—	—	4	4	4	—	—	—	—	—	2	—	—	—
<i>Syphilitic Sera (Controls)</i>																		
S <sub>1</sub>	—	4	4	—	4	4	—	—	4	—	—	2	4	4	4	4	4	4
S <sub>2</sub>	—	1	3	—	—	3	—	—	—	—	—	—	—	2	4	—	2	4

\* Second readings taken after addition of strong salt solution (Salt Dispersibility Technique).

the verification test, they generally show maximal reactivity at cold temperature. When the same sera are examined with the triple quantitative technique they commonly give maximal reactions at low salt concentration. When the pre-

cipitates thus formed are subjected to the salt dispersibility technique, they will generally be found to disperse.

Table 5 illustrates typical false positive reactions with five sera in which maximal reactivity is noted at cold tem-

TABLE 6

*Typical False Positive Reactions**Characteristics: Increased Reactivity at Low Salt Concentration and Dispersibility of the Precipitates*

Serum Dilutions	Per cent NaCl Used in Preparing the Serial Dilutions of Serum									
	0 Per cent Readings		0.9 Per cent Readings				2.5 Per cent Readings			
			1st		2nd *		1st		2nd *	
	1st	2nd *	1st	2nd *	1st	2nd *	1st	2nd *	1st	2nd *
<i>Serum 1</i>										
1:2.5	4	—	4	—	—	—	2	—	—	—
1:5	4	—	2	—	—	—	—	—	—	—
1:10	4	—	—	—	—	—	—	—	—	—
1:20	4	—	—	—	—	—	—	—	—	—
1:40	4	—	—	—	—	—	—	—	—	—
<i>Serum 2</i>										
1:2.5	4	—	4	—	—	—	—	—	—	—
1:5	4	—	1	—	—	—	—	—	—	—
1:10	4	—	—	—	—	—	—	—	—	—
1:20	4	—	—	—	—	—	—	—	—	—
1:40	—	—	—	—	—	—	—	—	—	—
<i>Syphilitic Serum (Control)</i>										
1:2.5	4	—	4	4	—	—	4	4	4	4
1:5	—	—	4	4	—	—	4	4	4	4
1:10	—	—	2	2	—	—	4	4	4	4
1:20	—	—	—	—	—	—	4	4	4	4
1:40	—	—	—	—	—	—	4	2	—	—

\* Second readings taken after addition of strong salt solution (Salt Dispersibility Technique).

TABLE 7

*Specific Reactions in Syphilis, Universal Reactions and False Positives in the Absence of Syphilis—Employing the Same Lipid Antigens*

Specific reactions	Obtained with serodiagnostic tests restricted to syphilitic reactions—but occasionally giving false positives.
Universal reactions	Given by practically all sera, with various techniques (different from serodiagnostic tests) including those based on the following three characteristics: low salt concentration, low temperature, and dispersibility of precipitates.
False positives	Generally show optimal reactivity at low salt concentration and low temperature, and the precipitates are dispersible.
Universal reactions in relation to false positives	Since low salt concentration, low temperature, and dispersibility of precipitates are characteristics of techniques giving both universal reactions and false positive reactions (and not of serodiagnostic tests), it is believed that false positives are highly potent universal reactions which have crossed the serodiagnostic threshold. Briefly, it is believed that certain non-syphilitic sera possess such marked universal serologic reactivity that they tend to give positive reactions even with tests that are technically restricted to the detection of syphilis.

perature, and the precipitates are dispersible. The controls, which consist of two syphilitic sera, show maximal reactivity at 37° C. and the precipitates are not dispersible. Table 6 illustrates typical false positive reactions with two sera in which maximal reactivity is noted under conditions of low salt concentration, and the precipitates are dispersible. The syphilitic serum control gives maximal reactivity under conditions of increased salt concentration and the precipitates are not dispersible.

#### RELATION BETWEEN UNIVERSAL REACTIONS AND FALSE POSITIVES

Is there a direct relationship between universal reactions and false positives? In Table 7 an attempt is made to correlate this relationship. It was seen in Table 4 that different sera show quantitative differences in universal reactivity and some show especially marked reactivity. It is believed that such sera, as for example Serum No. 3 in that table, may possess sufficient reactivity to break through the threshold of the serodiagnostic test. The technical barriers of modern serodiagnostic tests exclude the vast majority of non-syphilitic sera from reaching positivity, but it is believed that those sera which possess extremely high universal reac-

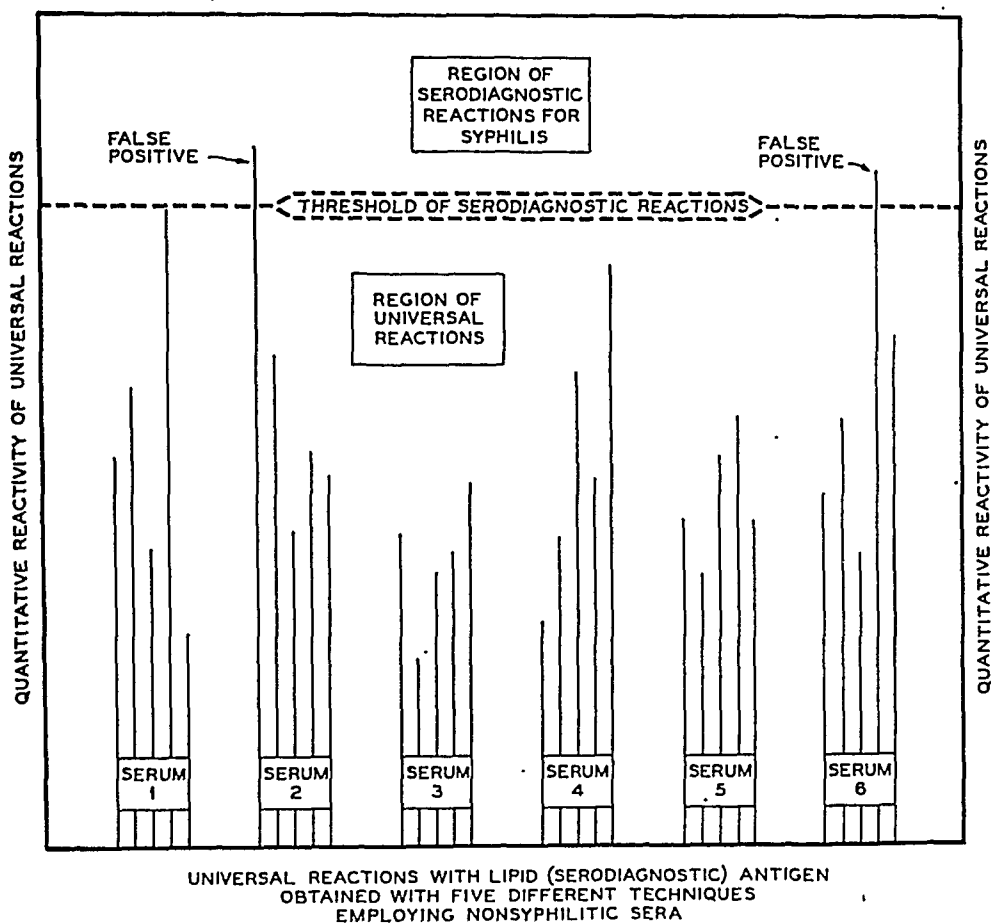
tivity do reach positivity with these tests and give false positives.

Chart 1 illustrates the concept that false positive reactions with serodiagnostic tests represent universal reactions of such high potency that they pass the serodiagnostic threshold. As already indicated, universal reactions can be elicited by different techniques. For illustrative purposes five techniques have been chosen, although it is believed that further studies will show that additional techniques could be developed for eliciting universal reactions. When the five chosen techniques are employed with non-syphilitic sera quantitatively, by determining the highest dilutions of serum which will give positive reactions, it will be found that each technique shows distinctive reactivity. The five techniques applied to six sera are represented in the chart by five columns for every serum, and the height of each column represents the reactivity of the particular technique employed. The heights of the columns differ because an individual serum may show quantitatively different reactivities with the different techniques.

The reactions of Serum No. 1 are confined to the region of universal reactions and are below the serodiagnostic threshold. Columns 2 and 4 reach close

CHART 1

ILLUSTRATING THE CONCEPT THAT  
FALSE POSITIVES ARE UNIVERSAL  
REACTIONS WHICH HAVE CROSSED  
THE SERODIAGNOSTIC THRESHOLD



to the threshold, but remain below. In the case of Serum No. 2, column 1 passes the serodiagnostic threshold. Stated differently, Serum No. 2 examined with technique 1 manifests such marked universal serologic reactivity with serodiagnostic antigen that the same serum examined with the technically restricted serodiagnostic test will also manifest some degree of reactivity, and give a false positive. In the case of Serum No. 6, it is column 4 that passes the serodiagnostic threshold, and that serum also will give a false positive reaction.

It is noted from the chart that the difference between the height of those columns which approach the serodiag-

nostic threshold and those which pass the threshold may be small. This critical difference in the reactivity of universal reactions close to the threshold helps to explain the fluctuating tendency frequently encountered in false positive reactions. It is well known that false positives may occur one day and be gone on repetition. Since minor quantitative differences in reactivity in the vicinity of the threshold are sufficient to change a reaction from negative to positive and *vice versa*, it is understandable why false positives show a tendency to fluctuate.

It is also understandable why most false positives are weak serodiagnostic reactions. With universal techniques

the reactions are very strong as is evident from the height of the columns which reach into the serodiagnostic region. But serodiagnostic techniques are designed for the detection of syphilis and they are unfavorable to reactivity in the absence of syphilis. These techniques are indeed so restrictive that the vast majority of sera giving universal reactions are completely negative with serodiagnostic tests.

It must be kept in mind that the serodiagnostic threshold is not identical for all serodiagnostic tests. The more sensitive the serodiagnostic test, the lower is its threshold, i.e., the larger the number of universal reactions that will cross its threshold. Hence, a super-sensitive test will give a greater number of false positives. Occasionally, two tests of similar sensitivity will yet differ in giving false positives in individual cases. Apparently, the mere

fact that a column of the universal reaction enters into the serodiagnostic region does not necessarily mean that it will cause a positive reaction with all tests. This difference is very likely due to different characteristics of the tests.

It would appear from the chart that false positives are not "false" but are offshoots of serologic reactions occurring on a biologically universal scale. The chart also points out the importance of emphasizing not increased sensitivity but increased specificity in serodiagnostic tests. For, when sensitivity is stepped up, the threshold is lowered toward the universal reactions and specificity is reduced.

#### *Different Types of False Positives*

If, according to Chart 1, any one of the universal reactions, as represented by the individual columns, can potentially cause a false positive, it must be

TABLE 8

*False Positives Characterized by Positive Reactions at Low Salt Concentration and Negative Reactions in the Differential Temperature Technique*

Patient	Triple Quantitative Technique				Differential Temperature Technique		
	Serum Dilutions	NaCl Used in Serial Serum Dilutions			Precipitation at		
		0 Per cent	0.9 Per cent	2.5 Per cent	1° C.	37° C.	
S.K.	1:2.5	2 *	—	—	—	—	—
	1:10	4	—	—	—	—	—
	1:20	4	—	—	—	—	—
	1:40	4	—	—	—	—	—
	1:80	4	—	—	—	—	—
M.C.	1:2.5	2	—	—	—	—	—
	1:10	3	—	—	—	—	—
	1:20	3	—	—	—	—	—
	1:40	3	—	—	—	—	—
	1:80	—	—	—	—	—	—
C.C.	1:2.5	—	—	—	—	—	—
	1:10	1	—	—	—	—	—
	1:20	2	—	—	—	—	—
	1:40	4	—	—	—	—	—
	1:80	4	—	—	—	—	—
B.B.	1:2.5	4	—	—	—	—	—
	1:10	4	—	—	—	—	—
	1:20	3	—	—	—	—	—
	1:40	2	—	—	—	—	—
	1:80	1	—	—	—	—	—
R.S.	1:2.5	2	—	—	—	—	—
	1:10	4	—	—	—	—	—
	1:20	4	—	—	—	—	—
	1:40	4	—	—	—	—	—
	1:80	4	—	—	—	—	—

\* All precipitates dispersed upon addition of strong salt solution (Dispersibility Technique).



TABLE 9

*False Positives Characterized by Positive Reactions at Low Temperature and Negative Reactions in the Triple Quantitative Technique*

Patient	Triple Quantitative Technique				Differential Temperature Technique					
	Serum Dilutions	NaCl Used in Serial Serum Dilutions			Precipitation at					
		0 Per cent	0.9 Per cent	2.5 Per cent	1° C.*			37° C.		
W.T.	1:2.5	—	—	—	4	4	4	—	—	—
	1:10	—	—	—						
	1:20	—	—	—						
	1:40	—	—	—						
	1:80	—	—	—						
E.A.	1:2.5	—	—	—	—	4	4	—	—	—
	1:10	—	—	—						
	1:20	—	—	—						
	1:40	—	—	—						
	1:80	—	—	—						
J.J.	1:2.5	—	—	—	—	4	4	—	—	—
	1:10	—	—	—						
	1:20	—	—	—						
	1:40	—	—	—						
	1:80	—	—	—						
M.L.	1:2.5	—	—	—	4	4	4	—	—	—
	1:10	—	—	—						
	1:20	—	—	—						
	1:40	—	—	—						
	1:80	—	—	—						
J.K.	1:2.5	—	—	—	2	4	4	—	—	—
	1:10	—	—	—						
	1:20	—	—	—						
	1:40	—	—	—						
	1:80	—	—	—						

\* All precipitates dispersed upon addition of strong salt solution (Dispersibility Technique).

assumed that there are different types of false positives. One type might be caused by a particular universal reaction and another type by another reaction. Actually, long before we observed the existence of universal reactions, we recognized that there are different types of false positives detectable by different techniques, which explains the three techniques of our verification test.<sup>2</sup>

Tables 8 and 9 present illustrative cases of false positives, taken from our routine laboratory records, which show that these positives represent more than one type of reaction. In Table 8, the false positives are characterized by optimal reactivity at low salt concentration and in Table 9, by optimal reactivity at low temperature. Generally, false positives show optimal reactivity both at low salt concentration and at low temperature, but some show reac-

tivity at only one of these conditions.

An aspect of universal reactions and of false positives which has not been included in the tables is that different sera show different serologic patterns with given techniques. This aspect will be considered in a later publication.

#### *Experimental Evidence That Certain False Positives Are Universal Reactions Which Have Crossed the Serodiagnostic Threshold*

Table 10 presents an illustrative experiment in which universal serologic reactivity is demonstrated with three sera: one giving a false positive reaction with a serodiagnostic test, another a negative reaction, and a third, a true or specific positive reaction. The sera are serially diluted with water, with 0.3, 0.6, and 0.9 per cent NaCl solution. These dilutions are mixed with Kahn antigen suspension in a ratio of 6:1.

shaken 3 minutes, and diluent added of the same NaCl concentrations used in making the serial dilutions of serum. The results are then read without incubation and after 4 and 24 hours' incubation in the icebox.

It is evident from the table that the universal reactions are most marked after incubation. On examination of the results without incubation, it is noted that non-syphilitic serum A gives most marked reactivity in the serial dilutions of serum with water, less marked reactivity in the serial dilutions of serum with 0.3 and 0.6 per cent NaCl

solution, and least reactivity in the serial dilutions of serum with 0.9 per cent salt solution. This 0.9 per cent column is, of course, identical with the middle tube of the standard Kahn test. It is obvious, therefore, that the two plus reading in this column represents an overflow of the universal reaction into the serodiagnostic zone. Non-syphilitic serum B does not show this tendency to reach the 0.9 per cent column. The syphilitic serum C, however, shows most marked reactivity in this 0.9 per cent column, and very little reactivity in the water column. After

TABLE 10

*Illustration of a Serum Giving So Strong a Universal Reaction That It Reaches into the Serodiagnostic Zone, Resulting in a False Positive*

*Ratio of Serum: Kahn Antigen Suspension Employed, 6:1*

Serial Dil. of Serum	Readings Immediately After Shaking Period				Readings After 4 Hours in Icebox				Readings After 24 Hours in Icebox			
	NaCl Used in Serial Dilutions of Serum				NaCl Used in Serial Dilutions of Serum				NaCl Used in Serial Dilutions of Serum			
	0%	0.3%	0.6%	0.9%*	0%	0.3%	0.6%	0.9%	0%	0.3%	0.6%	0.9%
<i>A. Non-syphilitic Serum Giving Universal Reaction and Weak Serodiagnostic Nonspecific (False Positive) Reaction</i>												
Undil.	4	4	4	2	4	4	4	4	4	4	4	4
1:2.5	4	4	2	±	4	4	2	2	4	4	4	4
1:5	4	4	2	—	4	4	±	±	4	4	3	3
1:10	4	2	—	—	4	4	±	—	4	4	±	—
1:20	4	±	—	—	4	2	—	—	4	4	—	—
1:40	4	—	—	—	4	2	—	—	4	4	—	—
1:60	4	—	—	—	4	2	—	—	4	3	—	—
1:80	4	—	—	—	4	±	—	—	4	2	—	—
<i>B. Non-syphilitic Serum Giving Universal Reaction Only (Serodiagnostic Negative Control)</i>												
Undil.	—	—	—	—	4	4	—	—	4	4	—	—
1:2.5	—	—	—	—	4	4	—	—	4	4	—	—
1:5	—	—	—	—	4	4	—	—	4	4	—	—
1:10	2	—	—	—	4	2	—	—	4	4	—	—
1:20	3	—	—	—	4	2	—	—	4	4	—	—
1:40	4	—	—	—	4	2	—	—	4	3	—	—
1:60	4	—	—	—	4	2	—	—	4	2	—	—
1:80	4	—	—	—	4	±	—	—	4	2	—	—
<i>C. Syphilitic Serum Giving Both Universal Reaction and Serodiagnostic Specific Reaction (Serodiagnostic Positive Control)</i>												
Undil.	—	4	4	4	—	4	4	4	4	4	4	4
1:2.5	—	4	4	4	—	4	4	4	4	4	4	4
1:5	—	—	—	2	—	3	4	4	4	4	4	4
1:10	—	—	—	—	4	—	—	—	4	—	—	—
1:20	—	—	—	—	4	—	—	—	4	—	—	—
1:40	—	—	—	—	4	—	—	—	4	—	—	—
1:60	2	—	—	—	4	—	—	—	4	—	—	—
1:80	3	—	—	—	4	—	—	—	4	—	—	—

\* The column in which 0.9 per cent NaCl is used for serial dilutions of serum and the results are read immediately after the shaking period, represents a serodiagnostic reacting zone. The eleven remaining columns represent zones of universal reactions.

incubation at cold temperature, the results represent universal reactivities only.

It might be added that the false positive serum A in the table was obtained from a serviceman who had recently returned from the Pacific area, presumably with malaria.

In view of the fact that there are different types of false positives, the data in Table 10 cannot be taken as proof that all false positives represent spill-overs of universal reactions into the serodiagnostic zone, but it would seem reasonable to assume that the same holds true to all false positives.

#### SUMMARY

1. Data are herewith presented showing that lipid antigen and serum employed in tests for syphilis can be so treated technically as to elicit positive precipitation reactions in most non-syphilitic persons. These reactions are referred to as universal serologic reactions because they are biologically widespread. Universal reactions differ from serodiagnostic reactions in that the latter are technically restricted to the detection of syphilis.

2. Universal reactions can be elicited in serum-lipid antigen combinations under a variety of technical conditions.

Low NaCl concentration and low temperature are optimal in eliciting these reactions, and the precipitates formed are generally dispersible in concentrated NaCl solution.

3. Low salt concentration and low temperature are also optimal for false positive reactions, and the precipitates formed are generally dispersible in concentrated NaCl solution.

4. The fact that the same technical conditions are optimal for universal and false positive reactions suggested a close relationship between these two reactions, and the concept that false positives are highly potent universal reactions which have passed the serodiagnostic threshold and have become manifested with serodiagnostic tests.

5. In agreement with this concept, an illustrative case of a weakly false positive reacting serum, is presented in which the universal reaction is of such high potency that it reaches into the serodiagnostic zone and shows positivity in that zone.

#### REFERENCES

1. Kahn, R. L., Marcus, S., McDermott, E. B., and Adler, J. A Serologic (Nonsyphilitic) Reaction Approaching Universal Sensitivity. *J. Investigative Derm.*, 5:459, 1942.
2. Kahn, R. L. *Technique of the Standard Kahn Test and of Special Kahn Procedures*. University of Michigan Press, Ann Arbor, 1946, p. 31.

# Colorado Tick Fever\*

LLOYD FLORIO, M.D., DR.P.H., F.A.P.H.A., AND  
MABEL O. STEWART

*Department of Public Health and Laboratory Diagnosis, University of Colorado  
School of Medicine, Denver, Colo.*

DISEASES have occasionally been given geographical names, such as Rocky Mountain spotted fever, because they were originally thought to be limited to sharply circumscribed areas. With the dissemination of information concerning such diseases, it has usually been found that their distribution is much more cosmopolitan than was once supposed. This might also be true for Colorado tick fever, a disease frequently recognized in Colorado and occasionally in other Rocky Mountain states. The larger number of cases diagnosed in Colorado can be explained by the interest created by Becker<sup>1</sup> who described it as a distinct disease entity and who gave it the name by which it is now known.

## EPIDEMIOLOGY

Individuals with Colorado tick fever practically invariably give a history of being bitten by the wood tick, *Dermacentor andersoni* Stiles. In every instance, the patient has been in a tick infested area 4 to 6 days prior to the onset of the illness. The disease, like Rocky Mountain spotted fever, is found only during the spring and early summer when the ticks are active. As soon as it becomes hot and dry, the wood ticks disappear and so does Colorado tick fever. Although experimental

work on the epidemiology of the disease still continues, the wood tick has been found to be naturally infected.<sup>2</sup> Laboratory studies indicate that the infectious agent is transmitted transovarially to at least the next generation of adults.<sup>2</sup>

## CLINICAL

The onset is sudden and characterized by chilly sensations and a generalized aching of the whole body. Headache, deep ocular pain, and backache particularly in the lumbar region are the prominent symptoms. Photophobia is relatively frequent. Anorexia, nausea and sometimes vomiting are common. With the onset of symptoms, the temperature begins to rise and within 24 hours is usually between 102° and 104° F. There is a corresponding elevation of the pulse rate. The attack lasts for approximately 2 days. The temperature returns to normal, the symptoms completely disappear, and the individual feels well enough to resume normal activity. This symptom-free phase of approximately 2 days is followed by a recurrence of the symptoms and fever of about 3 days' duration. Convalescence is characterized by mild weakness and lassitude lasting 3 to 7 days. Single and triple attacks are occasionally observed. While periods of attack, remission and attack usually last approximately 2 or 3 days, each may vary from 1 to 4 days. Either attack may be more severe than the

\* Presented before the Epidemiology Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 14, 1946.

other. During the remission, it is common for the temperature to be subnormal.

Conjunctival injection and mild erythema are the usual and only physical findings other than the elevation of temperature and pulse rate. Exanthemata are never observed. Complications are unknown, nor is the disease ever fatal. Treatment is purely symptomatic. Aspirin and codeine suffice in the alleviation of symptoms.

The only significant laboratory findings are related to the white blood cells. Beginning with the onset of symptoms, there is a progressive decrease in the number of leucocytes which usually reach the lowest point at the beginning of the second attack. Typically the white blood cell count falls to between 2,000 and 3,000 cells per cubic milli-

meter, although one as low as 1,200 has been observed.<sup>3</sup> All of the leucocytes are reduced in absolute numbers except the monocytes. There is a definite shift to the left in the polymorphonuclear neutrophils. It is common for the band forms to outnumber the segmenters when the count is lowest. Four to 7 days following clinical recovery, the white blood cell and differential counts have returned to normal.

The differential diagnosis is not difficult. There are no other diseases occurring in the Rocky Mountain region with which Colorado tick fever can be confused. The history of exposure to ticks, the saddle-back temperature curve, the symptoms, and the white blood cell picture have made the diagnosis obvious after 4 or 5 days of observation. Figures 1, 2, and 3 depict

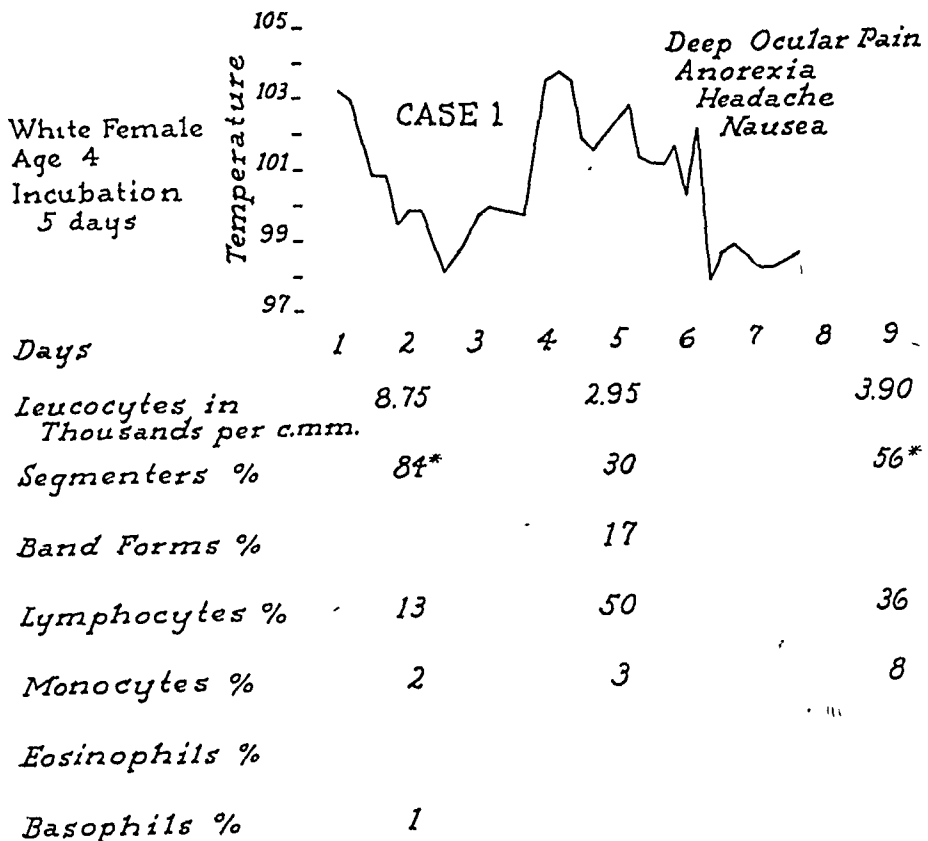


FIGURE 1—A Naturally Acquired Case of Colorado Tick Fever

\* Schilling hemogram not done

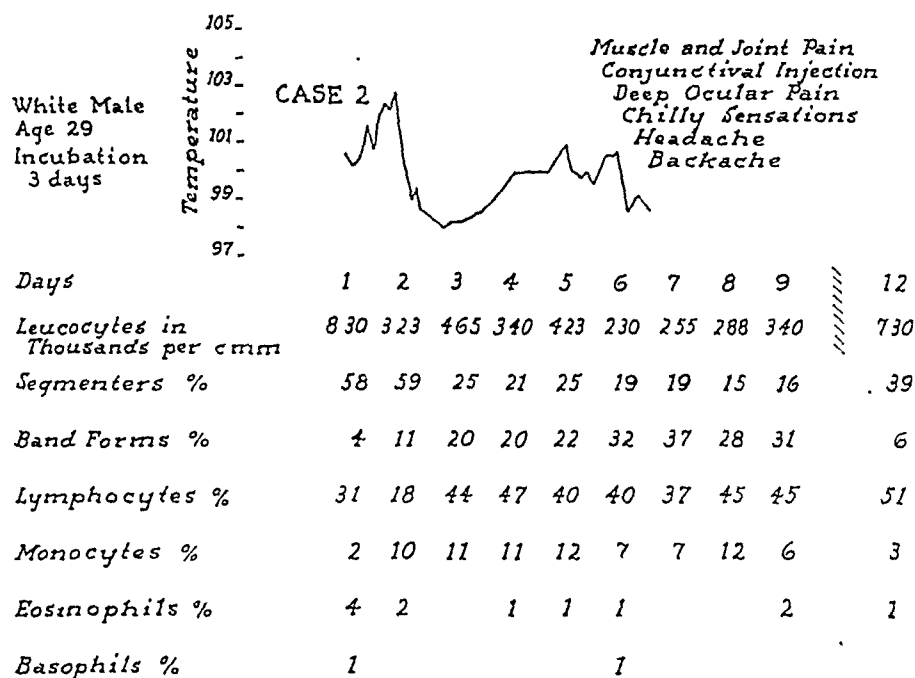


FIGURE 2—Colorado tick fever in an experimental subject

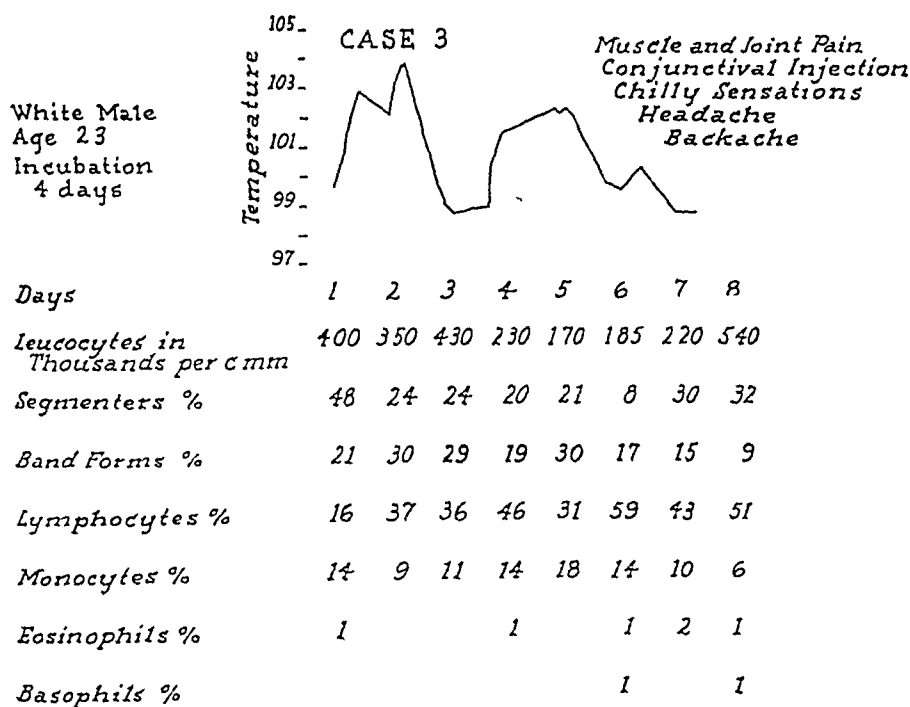


FIGURE 3—Colorado tick fever in an experimental subject

the history, physical findings, temperature curve, and white blood cell findings in three instances of the disease.

Reinfection with Colorado tick fever has never been reported. Three volunteers were inoculated with a different strain of the infectious agent 9 to 12 months after the original infection.<sup>3</sup> They did not develop the disease.

#### ETIOLOGY

Previous attempts to visualize the infectious agent of Colorado tick fever microscopically or by culture had been unsuccessful as had all previous attempts to induce infection in experimental animals.<sup>4</sup> We were able to infect the golden hamster (*Cricetus auratus*).<sup>3, 5</sup> Filtrates from gradacol membranes of known porosity were tested on these animals and it was established that the infectious agent is an extremely small virus of a particle size approximating that of yellow fever and poliomyelitis.<sup>6</sup> Kaprowski and Cox<sup>7</sup> have recently reported the adaptation of the virus to mice and to developing chick embryo.

#### RELATIONSHIP OF COLORADO TICK FEVER TO ROCKY MOUNTAIN SPOTTED FEVER AND DENGUE

Because Colorado tick fever is transmitted by the same vector as Rocky Mountain spotted fever, there has arisen a belief that this disease is a mild manifestation of Rocky Mountain spotted fever. Immunization against Rocky Mountain spotted fever does not protect against experimental<sup>3</sup> or naturally acquired<sup>8</sup> Colorado tick fever. Two cases of individuals who had had both diseases have been brought to our attention.<sup>9</sup> Another is reported by Shaffer.<sup>10</sup> Finally the fact that Rocky Mountain spotted fever is due to a Rickettsia while Colorado tick fever is caused by a virus, establishes these diseases as separate clinical entities.

The striking clinical and hemato-

logical resemblance to dengue, however, has caused various investigators to wonder whether Colorado tick fever might not be tick-borne dengue. The lack of a rash in Colorado tick fever, and the absence of a prolonged convalescence, are the important clinical differences. Since both diseases confer at least a short immunity to themselves, each should confer immunity against the other if they are identical. The problem was resolved by inoculating human subjects first with the virus of one disease and, after a period long enough to develop an immunity, with the virus of the other. They developed both diseases, indicating that the two conditions are probably distinct entities.<sup>11</sup> Using essentially the same technic, Pollard and his coworkers confirmed these results.<sup>12</sup>

#### SUMMARY

Colorado tick fever is a tick-borne viral disease, confined as far as is now known to the Rocky Mountain region. It is characterized by generalized aching, a saddle-back temperature with complete disappearance of symptoms during the remission and a markedly reduced white blood cell count with a shift to the left. The disease confers a definite immunity. Neither death nor complications occur. Treatment is symptomatic. While clinically and hematologically similar to dengue and often assumed to be a mild form of Rocky Mountain spotted fever, Colorado tick fever is a distinct disease entity.

#### REFERENCES

1. Becker, F. E. Tick-Borne Infections in Colorado. *Colorado Med.*, 27:36, 87 (Feb.), 1930.
2. Unpublished data.
3. Florio, L., Stewart, M. O., and Mugrage, E. R. The Experimental Transmission of Colorado Tick Fever. *J. Exper. Med.*, 80:165 (Sept.), 1944.
4. Topping, N. H., Cullyford, J. S., and Davis, G. E. Colorado Tick Fever. *Pub. Health Rep., U.S. P.H.S.*, 55:2224 (Nov.), 1940.
5. Stewart, M. O., Florio, L., and Mugrage, E. R.

Hematological Findings in the Golden Hamster. *J. Exper. Med.*, 80:189 (Sept.), 1944.

6. Florio, L., Stewart, M. O., and Mugrage, E. R. The Etiology of Colorado Tick Fever. *J. Exper. Med.*, 83:1 (Jan.), 1946.

7. Kaprowski, H., and Cox, H. Adaptation of Colorado Tick Fever Virus to Mouse and Developing Chick Embryo. *Proc. Soc. Exper. Biol. & Med.*, 62:320 (June), 1946.

8. Florio, L., Mugrage, E. R., and Stewart, M. O. Colorado Tick Fever. *Ann. Int. Med.*, 25:466 (Sept.), 1946.

9. Deem, A. W., and Huddleston, O. L. Personal communications.

10. Shaffer, F. C. Personal Experiences with Colorado Tick Fever. *Colorado Med.*, 32:226 (Mar.), 1935.

11. Florio, L., Hammon, W. McD., Laurent, A., and Stewart, M. O. Colorado Tick Fever and Dengue. *J. Exper. Med.*, 83:295 (Apr.), 1946.

12. Pollard, M., Livesay, H. R., Wilson, D. J., and Woodland, J. C. Immunological Studies of Dengue Fever and Colorado Tick Fever. *Proc. Soc. Exper. Biol. & Med.*, 61:396 (Apr.), 1946.

## Best Sellers in the Book Service for February

The Control of Communicable Diseases. American Public Health Association. 6th ed. 1945 .....	\$ .35
Diagnostic Procedures and Reagents. American Public Health Association. 2nd ed. 1945 .....	4.00
Industrial Toxicology. Hamilton and Johnstone. 1945.....	2.50
Infant and Child in the Culture of Today. Gesell and Ilg. 1946.....	4.50
Local Health Units for the Nation. Emerson and Luginbuhl. 1945.....	1.25
Municipal and Rural Sanitation. Ehlers & Steel. 3rd ed. 1943.....	4.50
Preventive Medicine and Public Health. Wilson G. Smillie. 1946.....	6.00
Public Health—A Career with a Future. American Public Health Association. 1946...	.10
Recommended Practice for Design, Equipment and Operation of Swimming Pools and Other Public Bathing Places. American Public Health Association. 1942.....	.50
Standard Methods for the Examination of Water and Sewage. American Public Health Association. 9th ed. 1946.....	4.00

Order from the Book Service  
AMERICAN PUBLIC HEALTH ASSOCIATION



# The Nurse's Rôle in Health Education in Industry

BETHEL J. McGRATH, R.N.

*Powers Dry Goods, Inc., Minneapolis, Minn.*

*"The application of the gifts of science is now more important than their increase."*

IN his autobiography Clarence Darrow observes, of the tenacity with which man clings to life, "I sang hymns (as a boy) that I remember to this day. Among them was one which each child loudly shouted 'I want to be an angel and with the angels stand; a crown upon my forehead, a harp within my hand.' . . . I sang it earnestly and often, but in spite of my stout and steady insistence 'that I wanted to wear wings, here I am at 75 still fighting to stay on earth.'" The fight is universal but few remain in the battle at 75. Our weapons are not good enough or our strategy is poor. In spite of the fact that man values life, *this life*, above all else, his efforts to vitalize and prolong it are largely haphazard.

The first world war disclosed an appalling number of young men in poor physical condition. Something was to be done about it. The second world war also disclosed an appalling number of the next generation in poor physical condition. Whatever had been done during the interim to build health and prevent disease had not been enough. Sufficient scientific information was available to either generation which, if applied, would have resulted in a better health record. Are large numbers of our people economically unable to maintain a healthful standard of living;

foolishly optimistic about their chances of survival regardless of how they live? Have they never heard the facts; or if they have, has the information been given at a time, or in such a fashion that it has failed to impress them?

Early and constant exposure to health education through maintenance of community health services that begin with prenatal care and teaching, and continue through the preschool, school, and young adult groups, naturally has its effect upon the health level of the employed population of a community. However, not too much can be expected of a particular local health program by employers of labor because the population is constantly shifting; and highly industrialized areas draw from all parts of the country as well as from foreign countries. Standards and facilities in both the fields of education and public health differ greatly between communities, and inhabitants of many areas are exposed to little of either.

The natural optimism of youth, absorbed with living and unconcerned with dying, operates against the acceptance and use of much information that is presented during high school and college. Inadequate methods of presentation, and failure to develop athletics within the school for *all* to participate in, instead of only a few, both render the health education and physical fitness programs of schools much less effective than they should be.

Whatever may be the underlying causes, large segments of our population reach wage earning status either uninformed, or unimpressed with facts essential to health practices. This may mean the difference between a long and a short span of useful years, with all that it implies to the health and security of their dependents. Nurses who recognize the seriousness of this unawareness among young adults, and the parents of growing families invent ways to overcome it. Much of the worth of an industrial nurse to her company and to the community lies in her awareness and inventiveness.

There are sizeable obstacles to group educational work on the job which will not be overcome for a long time, if ever. Few employers sufficiently realize the value of sound health instruction to pay workers for taking it. Employment personnel, charged with keeping down labor costs, naturally are loath to authorize paid time spent at something other than job performance. Department heads, in need of workers are intolerant of anything that interferes with getting them on the job as fast as possible and keeping them there. And a natural antipathy to "classes" on the part of the working population is a more potent factor than any of the above. When adults choose to attend classes these are as a rule something of a vocational nature which will advance them in the kind of work they are doing, or teach them a trade or profession which they prefer to their current employment.

A primary objective of young workers tasting independence for the first time is to escape from all of the restrictions placed upon children. They want to eat what they like, wear what they wish, go where they please, make lots of money and spend it as they like and, God willing, they do. Escape from classrooms is one of the freedoms they cherish most. Resistance to on-the-job classes in subjects unrelated to their

special skills is about the same whether the worker is an eighth grade graduate or possessor of a college diploma. The latter feels frequently that he needs nothing the nurse can offer except medicine for a headache, although his knowledge of health protection is seldom on a par with his other attainments.

The point of lowest resistance to group health instruction on this obstacle course is during the orientation and training period of new workers. Almost any personnel or training director will spare ten minutes out of the time allotted to the new workers' introduction to the job for a health talk by the nurse, particularly if the talk is outlined so that the value of points which are to be made is obvious. This is the strategic time to gain the attention and coöperation of workers because they are facing a new job, and a new set of circumstances with prospects of success not heretofore achieved. They are open to suggestions that may help them get a right start. They have not yet learned the flaws in the organization which later may keep some of them from accepting even that which is good. They have not been coached by careless or maladjusted coworkers. And it increases their feeling of job security to learn early and at first hand that the nurse is an intelligent and considerate person, whom all may consult freely for the benefit of themselves or their families.

If employees are hired singly the nurse's introduction to the plant's health facilities will be done in an individual interview. However, if two or more are trained at the same time, which is usually the case, it is only a matter of good business to discuss topics which are of common interest to all in a group, since this arrangement conserves the time of both the nurse and the workers. Some time after this group conference, and before or very shortly after the worker goes on the job, there should be an individual confer-

ence between the nurse and each worker. During the group conference the class should be told that each will have an opportunity later to discuss in detail subjects introduced briefly in the class, or to ask for information in matters that are of interest only to the individual and not to the group. The individual interview with all new employees, following the group conference, gives the nurse an opportunity to become acquainted with each personally, to learn a little about the kind of person he is, and where emphasis must be placed to help him most, if help is needed. The employee has an opportunity to become acquainted with the health service, not as a patient, but as a visitor.

There is not room here to discuss the variety of topics that might be discussed with employed groups if circumstances require them and management and workers want them. Current texts on the subject carry detailed accounts. But if the employee is never summoned to another class during his working life, the introductory group conference, and ensuing individual conference, have built the foundation upon which well rounded health education of the worker, at work, can proceed. If this early two way approach is lost the same opportunity does not come again.

When preparing for the introductory health class (or health education conference) one must take into consideration at least the following factors:

1. The time allowance is likely to be short. One must condense facts for presentation so the talk does not seem hurried. Be explicit.

2. In this original talk, cover topics that are obviously of sufficient value to the individuals to hold their attention. The nurse's enthusiasm for the topic under discussion must be such that it communicates itself to the hearers. Droning through a routine speech wastes time for everyone. Respect for the independent status of the members of the group is part of the nurse's equipment. The workers' jobs do not depend upon passing

marks in health education. No form of coercion is possible. They will not fail if they leave the class without knowing a word that has been said. If they take anything away with them it is because the nurse has the ability to stimulate their interest and hold their attention. Whether she has this ability depends upon how much she wants to have it and how hard she works to acquire it.

3. She must strike a balance between underestimating the intelligence of the group, and taking for granted that what is common knowledge to herself is also to others. This must be borne constantly in mind throughout the nursing program and not confined to the original lecture.

4. It is necessary to have specific information for workers on specific jobs. If the class is a mixed group of men and women, or workers on widely differing kinds of work, some of the more personal aspects of job health may have to wait for the personal interview. As a rule a good deal of it can be handled in the group session.

Assuming that this introductory health class is an innovation, time will probably be allowed for only the briefest introduction to the plant's health facilities, which may consist chiefly of the nurse and her work. However, if one looks around there are a good many factors in the most humble organization that contribute to health and morale. The following outline may suggest points to be covered in a plant of a few hundred with full-time nurse and part-time physician.

#### 1. Medical and Nursing Service

- a. Location and hours.
- b. Day and hour of the doctor's visits.
- c. Routine followed in reporting all accidents.
- d. Routine followed in reporting off for illness, and upon return to work following illness.
- e. This health consultant service is here to be used freely by all. Better to use it early and often than to wait too long. Much less wasteful of time, money, and comfort to prevent than to cure.

#### 2. Employees' Cafeteria

- a. Hot midday meal at cost, containing all necessary food elements for balanced diet. This is of especial value to those who eat all meals away from home.
- b. Balanced diet better for one than vitamins by the bottle and much less expensive.
- c. A heating plant functions efficiently only when properly fueled, and the body when well fed. More information on food in

relation to health and efficiency in the nurse's office and on bulletin boards.

### 3. *Recreation Facilities*

These may be extensive or limited to a ping-pong table or a girl's club, or less. However, almost any organization that wants it now has its bowling team, base ball club, golf tournaments, hikers' club, chorus orchestra, or band. Almost any type of recreation that two or three have the interest to sponsor and push will bring followers because there is naturally a wide diversity of interests among adults.

These activities may be mentioned by the personnel or training director, but repetition that ties them in with health is desirable. The wrong kind of fun results too often in poor physical condition and the loss of a job. Many workers new to the urban area feel strange and alone and develop the habit of hanging out in beer parlors, drinking more than is good for them, and gambling, because no one has ever suggested that they do anything better. Diversions that keep inhabitants of cold climates out of doors during short summers should be stressed.

### 4. *Group Sick Benefits and Health Insurance*

The world is so full of these that the average individual is confounded by them. The genuine benefits of a plan can be told in about three sentences, and explained at greater length in the individual conference. (Unfortunately many of these have little to recommend them, but since non-profit hospitalization has taken hold, other forms of economic protection in sickness are improving in quality.)

These plans deserve much more attention than they get from many persons concerned with industrial health. One can vaccinate against smallpox, but not against appendicitis, or hundreds of other conditions that cost heavily. Inexpensive insurance against sickness is the average man's vaccination against ruinous costs in a crisis. (Most of these plans could and should give better coverage than they do.)

### 5. *Sources of Information*

Stress the importance of watching the bulletin boards for information on current events of all kinds in the plant and in the community. A large, well placed and well lighted bulletin board which carries an ever changing variety of information on such things as housing, sports events, extension classes, community agencies, theater, concerts, and other amusements, safety, nu-

trition, disease prevention, lost and found, and special items about the business that will interest workers, will naturally attract a great deal more attention than a board devoted to health and safety alone.

Accustomed to large colored posters, it is wise to vary the routine occasionally by posting an important item in fine writing. Almost everyone will examine it closely to see what it says. On any item concerning health always refer workers to the nurse for further details. Make announcements brief and to the point. Long strings of words, however beautifully grouped, get in everybody's way. Few will follow through to get the gist of the announcement.

The epidemiologists' presentation of health protection would cover many things not mentioned here, and probably few of those which are. Their contribution to science underlies the world's security against devastating epidemics. But this initial address to new workers is not as a rule the place to discuss control of contagious diseases. Adults have all heard of immunization and have either accepted or rejected it and are bored by it. There are ways of presenting it later which will not bore them. This is one of the important reasons for directing attention to the bulletin boards. During this initial address one emphasizes items of immediate advantage to the worker on the job, things that are available for his benefit within easy reach.

During the initial ten to thirty minute talk the nurse has begun the health education process within industry by explaining the uses of the medical and nursing service, the advantages of the in-plant food service, opportunities for recreation that are both healthful and enjoyable, inexpensive group protection against high costs of sickness and its attendant worries, and has ended by focusing attention upon the bulletin board as a reliable source of up-to-date information in most things that affect daily lives. Each of these is a positive service which can offend no one, regardless of religious beliefs or personal

antipathy to the subject of disease. Together they contribute immeasurably to the health and security of the workers and, intelligently managed, each carries on its own kind of health education.

Following the introductory health talk (or talks) the nurse's most effective educational work is done in her daily contact with individual workers. In these the nurse is not obliged to generalize at all. She can get down to facts pertinent to the one person in the picture at the moment. His interests, abilities, peculiarities, religious and family background, and anything else that goes to make up his particular set of circumstances can be given due consideration. He is receptive because he has come seeking information or counsel, and because he receives the undivided attention of a specialist in the health field.

The same topic discussed with several people may be handled differently each time. The facts of the matter are unchanged, but fitting them to circumstances which differ with each individual requires an adaptability of presentation that is wholly impossible in group teaching. Then too, many of the problems for which adults seek help are the kind that they would not discuss with a third party present. Altogether it is a good thing that industrial organization lends itself more readily to individualized health service than to mass instruction.

A recent poll of experts in the field of education produced the following conclusion (among others), "There should be more effort to deal with the needs and ability of each individual student. One of the curses of our school system has been too much standardization in the

treatment of all students, regardless of their immense differences in abilities and interests." This "difference in ability and interests" continues through life and is apparent throughout any industry, even between workers at the same bench. It is fortunate for both the nurse and the worker that circumstances favor the opportunity for her to deal separately with the "needs and abilities of each individual." There is much talk of treating people as persons. Here is where it is done.

On-the-job health teaching cannot supply what was omitted or poorly taught as the worker grew. It cannot undo the effects of superstition and misinformation which have undermined the health of many before they are employed. It can partially compensate for these errors by making available a fund of information for receptive adults which may enable them to overcome early handicaps and do better by their children than they have been done by. It can refresh the memory of those who have learned, but have forgotten. One cannot expect too great a holdover on any subject, including health, without an occasional refresher. It can keep workers informed of the advances in things to be done, that build and protect health, and stimulate their interest in securing these advantages for themselves and their children.

#### BIBLIOGRAPHY

- Kornhauser, Arthur. Poll of Experts. *Amer. Magazine*, Feb., 1946, pp. 48-49.  
Ewaldson, R. L. Our Children's Health, May It Soon Improve. *Everybody's Health*, May, 1946, p. 15.  
McGrath, Bethel J. Health Education. *Nursing in Commerce and Industry*, Commonwealth Fund, 1946, pp. 85-88.  
Darrow, Clarence. *The Story of My Life*. New York, Scribners, 1932.

# Studies of the Effect of the Provision of Good Housing on Health\*

IN considering the question of health and housing relationships, a first essential is to define terms. The objective of the housing movement today is the provision of good homes (meeting the requirements of healthful, safe, and comfortable living) in a wholesome physical environment (providing openness, indoor and outdoor space for recreation and play, and other essential amenities, and with freedom from excessive noise, dust, and traffic hazards). Conversely, bad housing means substandard structures, substandard occupancy, or a substandard physical environment. The objective of the public health movement is not just the prevention and cure of disease. It is, rather, the promotion of optimum physical and mental efficiency and well-being.

Regarded in this light, the relation of housing to physical and mental health may be said to be beyond dispute. Probably no accepted public health authority would question it. In fact, the Committee on the Hygiene of Housing of the American Public Health Association has in its *Basic Principles of Healthful Housing* set forth thirty ways in which housing does affect health, together with specific recommendations as to how the essential health principles can be achieved in the provision of housing.

Therefore, what we need is not more evidence that housing affects health in a general way, but rather scientific evidence as to whether housing has spe-

cific and measurable effects and, if so, how such effects can be measured. Until comparatively recent years, projects that provided good homes in a good neighborhood were few. Now, we have many such public projects for low-income families and some private projects for middle-income families. Several studies have already been made, and there will undoubtedly be many others undertaken in an effort to demonstrate the specific effects of the provision of good housing on morbidity and mortality or on both. To isolate the factor of housing and physical environment from other factors affecting health is fraught with difficulties. Much careful thought has been given to this phase of the problem, and one or two scientifically based studies of limited scope have been made. Most published reports on the specific effects have not succeeded in segregating factors other than the physical environment and, as a result, their conclusions can properly be challenged.

## GENERAL PRINCIPLES

In considering studies of the specific effects of housing on health, it may be pertinent to state certain general principles:

1. The case for proper housing for our people does not depend upon definite evidence that the provision of good homes in good neighborhoods lowers death rates or reduces sickness. It has ample justification in the democratic principles that people are entitled to an opportunity for decent homes just as they are entitled to an opportunity for education, and in the indisputable fact that high rates of sickness and death from preventable causes invariably prevail in substandard housing areas and that such areas are an economic and social blight to any community.

\* Progress Report by the Joint Committee on Housing and Health of the American Public Health Association and the National Association of Housing Officials

2. Poor housing is almost always a concomitant of low economic status. Ill health is associated likewise with low economic status, both as a result of it and as a cause of it. People of small income may be found in good housing and people of fair income in slums, but this is so exceptional as to be something of an anomaly.

3. The fact that these social conditions, as well as personality factors, are complex and interrelated makes the isolation of a single factor, such as housing, beset with difficulties.

4. There is no single measurement of health. Mortality, sickness, physical examination findings, weight variations (especially in children), nutritional changes and nervous and mental disorders are possible measurements of health and may reflect definite reactions to environment as well as to other conditions. To measure health in terms of some of these indices is challenging—in the case of morbidity, for example, because it is not easy to define states of morbidity precisely. Most of the indices are, in fact, measurements not of health, but of the absence of health.

5. Different factors in poor housing may produce different effects. For instance, inadequate illumination may affect the eyes; room crowding may be related to the spread of communicable diseases; outside toilets may be a factor in the transmission of diarrheal disease through flies.

6. There is no need for surveys of the specific effects of housing simply to produce additional arguments for housing improvement. If it is not possible to establish specific effects on health, the case for good housing still will have ample foundation.

7. Studies of an entirely different nature from those here under discussion, are of great importance. Exploration of the physiological and psychological effects of certain factors in the design and construction of housing, such as has been done by the Committee on the Hygiene of Housing and other groups, produce valuable information on the specific factors in housing and health relationships. On many of these matters the known facts are still far from adequate. For these purposes, laboratory research is usually involved, and while such research is not contemplated in the type of study here under consideration, its value should not be overlooked.

#### PURPOSES OF THE REPORT

At present, little is known of the *specific* ways in which the provision of good housing may affect the health of families. If it is possible to determine

scientifically whether there are such specific effects and, if so, precisely what they are, it will constitute a worth while addition to our knowledge. As has been noted, most studies made for this purpose have not succeeded in establishing such effects because one or more factors of importance have been overlooked.

The Joint Committee has felt that it can perhaps be helpful by undertaking two things:

1. To point out some of the pitfalls in studies of this nature.

2. To endeavor to suggest techniques for a type or types of study that would evaluate in an acceptable manner the precise effects of the provision of good housing on health.

#### I. PITFALLS TO BE AVOIDED IN STUDYING HEALTH CONDITIONS AMONG WELL-HOUSED FAMILIES (THE EXPERIMENTAL GROUP) COMPARED WITH POORLY HOUSED FAMILIES (THE CONTROL GROUP) AS A MEASURE OF THE SPECIFIC EFFECTS OF THE PROVISION OF GOOD HOUSING ON HEALTH

The following pitfalls frequently observed in studies of this type are listed:

1. *Failure to start with a definite statement of purpose, setting forth the problem or problems to be explored*

*Reason:* In studies of the kind here under consideration, the purpose should be not to prove an assumption that there are specific, measurable effects, but rather to determine, if possible, *whether* there are such effects. A clear statement of objective is helpful in avoiding an effort to prove what we want to prove rather than to develop facts that need to be known.

2. *Comparison of disease prevalence or mortality rates among public housing tenants with such prevalence or rates among families in some selected bad housing area unless the methods used insure that the groups*

*are comparable as to economic status, age groupings, family sizes, and the many other factors related to health*

*Reason:* Differences in these respects may influence health more than housing does. For example, poverty itself has a known relationship to health; and both sickness and mortality occur at high rates among people in the older age brackets.

3. *Failure to consider the selective effect of tenant eligibility policies established for housing projects*

*Reason:* Such policies may bar families with poor health, poor credit and behavior records, with uncertain incomes, or because of other special considerations so that comparison with a group of poorly housed families is valid only when the two groups are comparable as to these factors.

4. *Failure, in making such a comparison, to consider the possibility of greater initiative on the part of applicants for housing projects, as a self-selective factor*

*Reason:* Families of low income that apply may be superior and in better health than those of comparable income that do not make the effort to get into such projects.

5. *Comparison of health factors among well housed and poorly housed groups without separate classification for occupation: and ethnic groups—whites, Negroes, Mexicans, etc.*

*Reason:* There are marked differences in morbidity and mortality rates among such groups.

6. *Use of mortality rates (except infant mortality and deaths from home accidents) covering a short period of time as a measure of health*

*Reason:* While mortality rates may be affected over a long period of time by differences in environment, they are not likely to be immediately affected by such differences.

7. *Use of morbidity data for diseases such as diphtheria or smallpox for which effective immunizing methods are available*

*Reason:* The extent of immunization rather than environment will be the important determinant as to the case rates from such diseases.

8. *Basing data on health department reports of diseases (such as pneumonia, enteritis, acute communicable diseases) that may be poorly or unevenly reported, if such reports are used to show improvement in the health status of a group of families over a period of years*

*Reason:* Data based upon incompletely and unevenly reported cases will in such instances be unreliable. If a control group is used, however, the degree of incompleteness should apply equally to both the experimental and the control group.

9. *Failure to consider comparability of special medical services available to both groups*

*Reason:* If housing project tenants have special advantages of this kind not available to the control group, any differences in health status might be due to these services rather than to housing.

10. *Using small groups without applying measures to rule out chance differences*

*Reason:* The numbers of persons involved may not be sufficient to provide statistically reliable results. Under proper conditions carefully selected small samples may be entirely reliable.



11. *Failure to select a large enough control group to allow for shrinkage in numbers over a period of time*

*Reason:* The size of the control group which it is possible to keep under surveillance throughout the study may decrease to the point that it is too small for valid comparison with the experimental group.

II. SUGGESTED TYPES OF STUDIES FOR EVALUATING THE SPECIFIC EFFECTS OF THE PROVISION OF GOOD HOUSING ON HEALTH

The committee has given much time to the study of valid techniques that might serve this purpose. It has sought also the advice and counsel of expert social researchers not members of the committee.

Many possible measuring devices have been considered. We are not yet prepared to recommend any that we are convinced will stand the test of searching analysis. The task is fully as difficult as we recognized it to be when we began our work. As one research specialist has stated: "There are few problems in the realm of social science more challenging than the one with which this committee is faced, and I suspect there are few problems in any science more difficult to solve." We shall not attempt to propose a method of evaluation until we are satisfied that it is adequate to the purpose.

The committee asks to be continued and respectfully requests officials of the American Public Health Association and of the National Association of Housing Officials to assist the committee to secure a research staff qualified to explore under our direction methods we have under consideration—and any others that may be suggested. This requires more detailed study than the committee's busy members are able to give. If this can be done, the time required for our task can, we believe, be materially shortened.

*Joint Committee on Housing and Health, American Public Health Association and the National Association of Housing Officials*

BLEECKER MARQUETTE, *Chairman*  
ALLAN A. TWICHELL, *Secretary*  
CHARLES S. ASCHER  
ROLLO H. BRITTEN  
ALFRED L. BURGDORF, M.D.  
F. STUART CHAPIN, PH.D.  
HENRY S. CHURCHILL  
PAUL B. CORNELLY, M.D.  
CHARLES V. CRASTER, M.D.  
HAROLD J. DILLEHAY  
MYRON D. DOWNS  
CLARENCE W. FARRIER  
ALFRED H. FLETCHER  
L. M. GRAVES, M.D.  
B. M. PETTIT  
HUNTINGTON WILLIAMS, M.D.

# American Journal of Public Health and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 37

March, 1947

Number 3

---

## Editorial Board

REGINALD M. ATWATER, M.D.  
*Chairman and Managing Editor*

LEONA BAUMGARTNER, M.D.  
MARTIN FROBISHER, JR., D.Sc.  
PROFESSOR JOHN M. HENDERSON

RALPH S. MUCKENFUSS, M.D.  
STUART MUDD, M.D.  
RAYMOND S. PATTERSON, Ph.D.

C.-E. A. WINSLOW, Dr.P.H.

C.-E. A. WINSLOW, Dr.P.H., *Editor*

AUGUSTA JAY, *Editorial Associate*

---

## BCG

IT is commonly said that the progress of science knows no national boundaries; and such certainly ought to be the case. It is unfortunately not wholly true—as is evidenced in the history of BCG. It was in 1920 that Calmette and Guérin at the Pasteur Institute in Paris cultivated (by prolonged exposure to bile salts) a strain of tubercle bacilli which they considered non-virulent for man but capable of serving as an effective vaccine for the development of immunity against the disease. This discovery was hailed with enthusiasm in countries of Eastern Europe and South America, where French influence was strong; but for the most part ignored or opposed in Great Britain and the United States. It was fifteen years before any serious and impartial studies of the procedure were attempted in the Anglo-Saxon countries; and only today, after twenty-five years, have we fully appreciated the usefulness of BCG.

The first question to be settled with regard to a vaccine of this type is the possible danger that it may actually produce infection instead of developing immunity. Petroff at Saranac Lake showed that the "Bacillus-Calmette-Guérin" was actually a rough strain of the tubercle bacillus and that, in the laboratory, it could give rise again to the virulent smooth strain.<sup>1</sup> An episode at Lübeck in 1931 in which supposed BCG vaccination produced 72 deaths from tuberculosis among 251 infants treated<sup>2</sup> caused consternation. It was clearly shown however—and admitted by the laboratory worker who was responsible—that the Lübeck disaster was due to the fact that the BCG culture distributed had been contaminated with a normal virulent culture of the tubercle bacillus. The extensive use of BCG in France and Rumania and elsewhere without the slightest evidence of infection shows quite clearly that, whatever may be possible in the laboratory, BCG does not actually revert to a state of virulence in the human body. The *Journal of the A.M.A.* concludes "all reports agree that the vaccine properly prepared and used is harmless."<sup>3</sup>

The next question is "Does BCG actually protect against tuberculosis, and in

what degree?" The statistical evidence presented in the early French reports was extremely weak. Scepticism in accepting their results was fully justified; but such scepticism should have led to open-minded study, rather than to complete neglect of a procedure sufficiently promising to warrant impartial examination. W. H. Park was the only American investigator to exhibit interest and his results<sup>4</sup> were distinctly promising, though not conclusive. A second later study from New York City has criticised the method of selecting control cases in the Park experiment, and has analyzed a second series of cases with what the authors consider better controls and has obtained results showing no protective effect.<sup>5</sup>

It was not until about 1935 that more extensive studies were made in Scandinavia and only during the last two years have really significant data been available for the North American Continent.

Experimental use on a considerable scale in Scandinavia offered promise at an early date, as shown by Wallgren in 1934.<sup>6</sup>

More recently, Hertzberg<sup>7</sup> in Norway reported highly favorable results; and the National Society Against Tuberculosis now urges mass vaccination. Holm<sup>8</sup> has recently given us a picture of striking experience in Denmark. Since 1940 intracutaneous vaccination with BCG has become routine in the Copenhagen tuberculosis clinics, and Holm reports that "tuberculosis morbidity and mortality among the children in the tuberculosis milieu have been reduced to almost nothing after systematic vaccination has been carried through." A special study among the medical students of the university showed 52 positive x-ray changes among 1,950 students with negative reaction to tuberculin; 17 positive x-rays among 1,950 students who had become tuberculin-positive through natural exposure; and no positive x-rays among 175 students who had been made tuberculin-positive by vaccination with BCG. A very striking study was made on the island of Bornholm where tuberculosis had been completely eradicated among cattle and where a positive tuberculin reaction among human beings was rare. During the period 1936-1940 the incidence of new human cases by age reached a peak at ages between 15 and 40. After an extensive program of BCG vaccination this peak almost disappeared, as shown by the following figures:

		Age → 15-20	21-25	26-30	35-40
New Cases	1936-1940	17	35	19	14
	1941-1945	8	7	12	6

Evidence of this sort has convinced leaders in this field in Great Britain that BCG should be made available for trial in that country<sup>9</sup>; and recently the important possibilities of this protective agent have been made clear in the United States and Canada.

Aronson and Palmer<sup>11</sup> have recently made a contribution of the first importance. They dealt with a group of young persons on an Indian Reservation (ages, 1-20 years) of whom about one-half (1,550) were immunized with BCG while 1,457 served as controls. Tuberculosis rates were normally high among these Indians, and the results after a six year period are most striking. Twenty-eight deaths from tuberculosis occurred in the control group and 4 in the immunized group. The death rates per 1,000 person-years were 3.3 in the control group and 0.5 in the immunized group; and the death rates from other causes 3.9 in the control group and 3.3 in the immunized group. Furthermore, analysis by successive years showed that (for a six year period) the difference between the two

groups increased progressively, so that there was no tendency, in that time, for immunity to wear off.

Still more recently Ferguson in Canada<sup>12</sup> has presented equally striking figures on protection of nurses by BCG. In eight Saskatchewan general hospitals, and in the Winnipeg General Hospital, and in three Saskatchewan tuberculosis sanatoria, groups of nurses and other employees negative to tuberculin were immunized with BCG and compared with control groups not so protected. The numbers were considerable (over 4,000 in all, of which about half were controls). The results were as follows, after an exposure time of 1-2 years (comparable in protected and control groups).

	Per cent Subjects Developing Tuberculosis		
	Positive Tuberculin	Negative Tuberculin	
		Immunized	Control
Saskatchewan General Hospital	1.1	0.9	3.8
Winnipeg General Hospital	1.0	0.9	4.0
Saskatchewan sanatoria	2.8	2.3	11.7

Thus, it appears that BCG immunization reduced tuberculosis incidence by 76-80 per cent, a rate comparable to that for the group which had acquired a tuberculin-positive state in natural ways.

These investigations seem to demonstrate beyond much doubt that BCG may reduce the incidence of tuberculosis to less than one-fourth the level which it would otherwise attain. It seems clear that its use for specially exposed groups such as nurses and sanatorium attendants; for groups with high incidence of the disease, such as the Indians; and in areas where clinic and nursing sanatoria facilities are inadequate should prove a primary instrument in the control of tuberculosis. Its rôle in a community amply provided with such facilities is not clear. Levine and Sackett<sup>5</sup> believe that the routine vaccination of children in tuberculous homes is less advantageous than removal of the tuberculous source of infection from the home. An editorial in *Public Health Reports*<sup>13</sup> calls attention to the uncertainty of the period for which immunity against tuberculosis may be maintained. On the other hand, the Danish authorities<sup>8</sup> believe that the general use of BCG is warranted on the ground of the fact that the control of both bovine and human tuberculosis is rapidly building up a non-immune population and that it is important to build up an artificial herd-immunity to replace the immunity built up in the past by repeated small doses of infection.

The door is now open at least for the vigorous use of BCG immunization where it is desirable and for practical determination of the limits of that desirability.

#### REFERENCES

1. Petroff, S. A., and Brach, A. *A.J.P.H.*, 18:843 (July), 1928.
2. *München. med. Wchnschr.*, 79:311 (Feb. 19), 1932.
3. Editorial. *J.A.M.A.*, 132:581 (Nov. 9), 1946.
4. Park, W. H., Kereszturi, C., and Mushulow, L. *J.A.M.A.*, 101:1619 (Nov. 18), 1933.
5. Levine, M. I., and Sackett, M. F. *Am. Rev. Tuberc.*, 53, June, 1946.
6. Wallgren, A. *J.A.M.A.*, 103:1341 (Nov. 3), 1934.
7. Hentzberg, G. *Nord. med.*, 30:1237, 1946.
8. Holm, J. *Pub. Health Rep.*, 61:1298 (Sept. 6), 1946.
9. Tytler, W. H. *M. Officer*, 76:95 (Aug. 31), 1946.
10. Rosenthal, S. R. *J. Pediat.*, 26:470 (May), 1945.
11. Aronson, J. D., and Palmer, C. F. *Pub. Health Rep.*, 61:802 (June 7), 1946.
12. Ferguson, R. G. *Canad. Pub. Health J.*, 37:435 (Nov.), 1946; and *Am. Rev. Tuberc.*, 54:325 (Oct.-Nov.), 1946.
13. Editorial. *Pub. Health Rep.*, 61:801 (June 7), 1946.

## PRINCIPLES OF A STATE "EQUALIZATION" PROGRAM

THE program of federal and state aid to local communities appears now to be well established as a part of governmental policy in the United States. It has been adopted in recognition that improvement of the health of the people is a vital function of government and that—since disease knows no political boundaries—it is essential to equalize opportunities for health in city and country, in well-to-do and in less prosperous areas. Federal as well as state grants for this purpose are, in general, channelled through the state departments of health; and it is essential that these departments should adopt clear and equitable policies for the distribution of such funds.

Uniformity between the states in making available grants-in-aid need not—and probably should not—be considered essential. Local differences exist which fully justify variations in procedure. Yet certain broad principles have been established by experience which are generally applicable and seem worthy of review.

In the first place, it seems obvious that the local community which receives state or federal aid should itself participate financially—and in substantial degree—to the support of its own local program. The philosophy of public health practice in the United States and Canada is based on the principle of local self-government. We assume that the health program is one for which the citizen feels individual responsibility and in which he will actively participate.

In the second place, it is generally—though not universally—believed that the participation of the state in a health equalization program should extend, in greater or less degree, to all areas within the state. Against this policy it is argued that only the more needy areas should receive any financial assistance. From the standpoint of equalization, this would perhaps be justifiable; but from a practical standpoint, it must be recognized that the greater part of the taxes comes from the wealthier jurisdictions, and the latter do not look with equanimity on having their money used for the aid of weaker financial areas to the exclusion of any benefit to themselves. It is for this reason that basic federal grants are made available for all states, and supplemented by special grants on grounds of need.

The provision of basic aid to all local jurisdictions in a state has been approached in two ways: (a) by a flat grant, as was instituted in Ohio some years ago and as has been proposed in South Carolina, and (b) by a grant to the locality of a certain percentage of the local health budget, as is provided under the present New York law.

In all cases, state aid should be contingent upon approval by the state health authority of the contemplated program, the budget and the personnel of the local health service. Frequently it may be desirable for the state regulations to include a requirement that local jurisdictions below a stated population must combine with other areas to make efficient health administration possible before receiving an allotment. It will generally be desirable to include a state legislative provision limiting grants to those areas organized under a full-time health officer.

If the principles discussed above are adopted, every area within the state, having provided for an essentially sound organizational framework, and prepared to provide substantial financial support for its program, would be eligible for state aid.

The first step in setting up an equalization program, under these assumptions,

is for the state health department to establish a minimum per capita cost for basic health service. This figure will vary with health needs and with the economic capacities, but for any given state it should be established as the minimum figure (including federal, state, and local funds) which will give sufficient grounds to believe that an effective health unit can be maintained. Except on a temporary emergency basis, grants-in-aid should not be made to a locality unless such an adequate budget can be reasonably visualized. The actual figure will vary from state to state and from time to time; but Emerson's \$1.00 per capita should be generally considered as a minimum.

The next step is the program for state grants as an equalization factor to bring the actual contribution which the local area can make, plus the basic state grant discussed above, up to the per capita cost which has been fixed as a normal minimum. The object here, of course, is to insure that no local jurisdiction (or combination of them) will remain in want of a satisfactory level of health service merely because it occupies an unfavorable financial position.

To insure this end it would seem necessary to establish a state-wide schedule or formula for state aid. Regardless of the basis used, such an equalization factor should contain a provision that when a local jurisdiction makes a financial contribution proportional to its wealth (on a basis previously determined for all local jurisdictions) to meet its public health budget, and if the amount thus produced, plus the basic state grant, fails to meet its health needs, then the state will provide the funds necessary to bring the local budget up to the previously determined per capita figure.

Before this supplementary aid is given, one state might require that each jurisdiction levy a specified tax for public health purposes; another state may elect to say that each local jurisdiction must set aside a certain percentage of its tax income. Still another possible arrangement is one whereby the part of the budget not provided by the basic state grant is provided jointly from state and local sources, the local jurisdiction participating financially in the same ratio that its per capita assessed valuation bears to the average (or median) per capita assessed valuation of the state as a whole. Under this latter scheme, of course, local jurisdictions whose per capita assessed valuation is equal to, or above, that of the state as a whole, receive no aid beyond the basic grants.

One of the great difficulties is to establish a schedule that is easily explainable to, and understandable by, local and state authorities. If one goes much further than "assessed valuation," the problem is likely to become complicated, though it must be confessed that, in some circumstances, assessed valuation is a manipulable element. One of the southern states uses community population as the key element in its equalization scheme. They find that in their circumstances there is correlation between population and wealth and, therefore, smaller towns and counties are given, by stated schedule, greater aid than larger ones. Population has the merit of being easily understood and probably has a more human appeal than valuations.

In addition to the basic grant and the additional grant based on economic need, some administrators believe that, in any scheme for state aid, a provision should be made under which special grants could be made to meet unusual health problems existing in particular areas. There are others who contend that, in general, special problems (at least within a state) occur pretty largely in the areas of low wealth and that equalization provision on an economic basis will meet "special problem" needs. It is obvious that the provision of grants on a "special

problem" basis involves the possibility of political pressures which may be difficult to meet.

We realize that such a program as that here outlined may seem Utopian. It is probable that for some time to come state grants in many states will continue to be made on a catch-as-catch-can basis, for a full-time health officer in one town, a nurse in another, a health educator in a third, a venereal disease clinic in a fourth—in accord with local demands. We believe, however, that the principles outlined are in fundamental accord with those which are to be followed in such states as Illinois, New York, and Washington and that general practice is likely to move in the future in the direction indicated.

### STANDARDS FOR FROZEN FOODS?

TECHNOLOGICAL advances are constantly presenting new problems to the health administrator; and one such new problem is that of frozen foods. In any large community, there are now many stores handling products of this kind, and their number and variety are increasing year by year. In the past, frozen vegetables and meats were the chief products sold. Nowadays there are establishments providing complete cooked meals, ready to serve after placing them in the oven for ten minutes.

Are there possible new dangers involved in such procedures? We have no evidence that such is the case; and, in general, low temperatures are highly effective in checking bacterial development. If any hazard exists, we should expect that it might be due to rapid development of organisms present *after* the food has been thawed out. On general principles, however, any new situation of the kind will bear watching. As Dr. T. M. Drown of M.I.T. used to say about water supplies "the time of change is the time of danger."

Should we have special laboratory standards for the control of products of this kind? The head of one of our largest city laboratories reports that no such standards are available, and that the Federal Food and Drug Administration has no information on the subject.

It may be well that present sanitary regulations in regard to food handling and food handlers are entirely adequate and that no new hazards are involved in the problem of frozen foods as such. It would be well, however, for epidemiologists to be alert with regard to any disease possibility associated with such products; and it might be desirable for our larger laboratories to initiate preliminary research on the bacteriology of frozen food products.

#### *A.P.H.A. Membership Directory*

Copies of the Membership Directory of the American Public Health Association are still available to members on request.

# Credit Lines

## THE CRISIS IN EDUCATION

The National Education Association of the United States, Washington, D. C., packs a big wallop with the 16 pages of the annual report of the profession to the public entitled, "Our Children." Contrasting the citizens we need in a jet-propulsion age with the kind of citizen we have, analyzing the reasons for the vanishing teacher as underprivileged economic and social status and professional insecurity, it suggests that not less than 5 per cent of national income should be spent on public schools. There are charts showing that in 11 states one-fifth or more of adults over 25 years had completed four years or less of school, that enrollment in teachers' colleges has decreased from about 170,000 in 1940 to less than 70,000 in 1946, while emergency certificates have increased from 5,000 to 110,000 in the same period. For the skeptic who still thinks public education is a bit of a luxury, it points out that 31 of the 48 states hold the same relative position among the other states in the amount of retail sales per capita which they hold in relative educational levels of their population. Conclusion: "Schooling pays. We can afford to educate our children."

Perhaps the Amen corner will say "And we can afford to give all our people basic health protection."

## EDUCATION IN HANSEN'S DISEASE

The National Leprosarium in Carville, La., dates back to 1894 when it was opened for 8 patients by the State of Louisiana. In 1900 new buildings on another site were burned down by neighbors strongly opposed to such a hospital in their neighborhood. Hence the original site, the old Indian Camp

Plantation, was continued with the addition of suitable cottages and hospital. By February, 1931, after a long period of negotiation, title of the Louisiana home was transferred to the U. S. Public Health Service under whose jurisdiction it has since been operated. At present there are modern fireproof buildings for 480 ambulatory patients and 65 hospital rooms for bed patients on a 350 acre tract of land. It is a self-sustaining community with its own power plant, water supply, sewage disposal, dairy, farms, etc. Among the activities of the patients is the monthly publication, *The Star*, whose masthead carries the words, "Radiating the Light of Truth on Hansen's Disease." Among its chief aims is to reëducate the public with respect to leprosy (they prefer to call it Hansen's Disease) and root out many of the misconceptions about it that go back to Biblical times.

A recent issue of *The Star* quotes F. C. Lendrum, M.D., Assistant Professor of Medicine of the University of Illinois College of Medicine, to the effect that "At the present time a person who is branded as a leper suffers more from the word than from the disease. Leprosy is certainly the least communicable of all communicable diseases. It could be treated in general hospitals with vastly more safety than can tuberculosis. The public health problem at present is less that of discovering new drugs for the treatment of leprosy than that of persuading patients stigmatized as lepers to submit to treatment."

As a contribution to the education of the public in a proper perspective, *The Star* of July, 1946, reproduces, prior to publication, the chapter on Hansen's Disease in *Opportunities for Service to Mankind*, by Col. C. H. Rarey, U.S.A.



Ret. Here is given the history of the disease and the isolation of the *Bacillus leprae* by the Norwegian Hansen in 1874. He outlines five current needs with respect to the problem and makes suggestions for citizen service in connection with each. The five are:

a. Research into the cause of and method of transmitting leprosy. This is the chief activity of the Leonard Wood Memorial (American Leprosy Foundation).

b. Need for reëducating the American public upon the subject of leprosy. Among facts mentioned here are that, in the 52 years of the National Leprosarium's existence, not a single member of the medical or nursing staffs has contracted the disease.

c. Reconsidering and changing the present segregation policy. This policy defeats its own purpose because it prevents many sufferers from coming under treatment. If they were hospitalized rather than banished many would be returned to lives of usefulness.

d. Rehabilitation of patients at the National Leprosarium, particularly through an extension of the occupational therapy program.

e. Moving the Leprosarium activities to a cooler, dryer climate.

Further timeliness of this problem is indicated by news from the Advisory Committee on Leprosy to the U. S. Public Health Service. Meeting in Washington in December, this committee, made up of a distinguished group of leprologists and interested citizens, recommended to the Surgeon General an approach to the problem from the viewpoint of public health rather than the present segregation and institutional care. Emphasis should be upon case finding, outpatient treatment, periodic reëxamination of discharged patients, and a program of education for diseased persons, their families, and the public. This program should be carried on with the collaboration of state and local health departments and medical schools with the main effort in endemic areas—California, Florida, Louisiana, and Texas. Each of these states should have a special treatment center to replace the present Leprosarium.

While these basic long-range recom-

mendations are being put into effect this Advisory Committee recommended minor changes in existing policies at the Leprosarium—extended leave privileges, appointment of medical-social workers to the staff, extension of occupational and physical therapy, increased recreational facilities, codification and publication of existing regulations, and an intensive educational program for patient, family, and general public.

#### CREDIT WHERE CREDIT IS DUE

Dr. James E. Perkins, Chairman of the Committee for the Evaluation of Methods to Control Air-borne Infections has asked the JOURNAL to call attention to the fact that the report entitled "The Present Status of the Control of Air-borne Infections," appearing in the January JOURNAL was prepared by Dr. Alexander Langmuir, Associate Professor of Epidemiology, the Johns Hopkins University School of Hygiene and Public Health, Baltimore.

#### AN INVESTMENT IN PERSONNEL ADMINISTRATION

EDITOR'S NOTE: The report of Charles B. Frasher, Field Consultant of the Merit System Unit, American Public Health Association, on a visit to a small mid-western city is abstracted here for the interest of health officers, particularly those with relatively small staffs.

The health officer of a small mid-west city was the first local health officer to request field consultation services which were made available by the American Public Health Association following a grant-in-aid by the National Foundation for Infantile Paralysis, Inc. A visit of four days was made at his request to set up a "merit system."

The health officer explained that he did not know much about a merit system of personnel administration but wanted to take advantage of the good principles inherent in such a system.

It was decided that the first and most important job would be the classification of positions in the department. Twenty-nine employees required about 29 separate class descriptions or specifications due to the complexity of the work. Believing it would produce greater acceptance of the plan if the director of each service had a part in working out a classification plan, the health officer, the director of each service, and the consultant wrote the job description for each director and, in some cases, for one or two subordinate positions. The director was then given the task of developing the other job descriptions in his unit. The job descriptions in the classification plan, being a statement of the facts about positions for the guidance of employment officers and employees, were written according to the following outline:

1. *A title*—descriptive of the position
2. *A definition*—a brief description of the duties
3. *Examples of work performed*—giving in considerable detail the duties of a group of similar positions
4. *Minimum qualifications*—including the education and experience and the knowledge and abilities which are the minimum necessary for the successful performance of the duties of the position

A statement including the above is called a *job description* or a *class specification* of a *class of positions*. In any well written plan there is also a *range of classes*, a series of positions increasing in responsibility and experience required, whereby an employee can see that by the acquisition of additional qualifications he can advance to more responsible duties. These are now complete and are being reviewed by subject-matter consultants on the Merit System Unit staff.

The next step was to develop a compensation plan which, since the city council was considering "cost-of-living" increases, was developed separately from the classification plan. The ad-

ministrative staff met to consider salaries for all the classes of positions in the classification plan. A number of local conditions had to be considered—available finances, services to the city, comparable wages in industry and business. The fact that the city fathers recognized the importance of public health by making the health officer the highest paid city official, made the task easier. A compensation plan, evolved after discussion, provided for:

1. A minimum entering wage
2. Periodic increases for satisfactory work
3. Maximum wage

The group would not, at this time, approve a proposal to provide for additional increases for satisfactory service after a period of service at the maximum wage.

The next task was to write some operating rules and regulations relating to personnel management. The state health department has a well written set of rules and regulations for operating a merit system of personnel administration. A copy of these was secured and a set of rules, patterned after the state's rules, was developed. This was important in view of the probability of using some of the services of the state at a later date. The rules, as finally written, included such details as the responsibilities of the health officer and the advisory health council, the methods of selecting personnel and determining eligibility for employment, methods for promoting, demoting or releasing persons from employment, sick and vacation leave policies, and the like. A retirement plan was proposed and the health department officials will investigate some plans.

The problem of using examinations for selecting persons was next discussed. There was no local examining authority in the city other than a branch office of the U. S. Civil Service Assembly. The health officer decided that he did

not want to make a final determination at this time. It was therefore suggested that the health officer call his system "personnel administration" or "personnel management" rather than to use the term "merit system," for the latter includes equal opportunities for everyone to become eligible for employment. At a later date the health officer will adopt this latter principle of selection by competition or by merit.

This experience of working with a local health officer and his staff in preparing a classification plan, compensation plan, and operating personnel management rules was a most enjoyable one and it was the consensus that health work will be improved by the fact that properly qualified persons will be secured for the important public health tasks, and by the fact that employees will know their rights and privileges.

The group agreed that too much mystery surrounds the magic words "merit system." When broken down into its component parts, it is simply an agreed-upon system of providing qualified workers for duties and of assuring them of good working conditions and freedom to work within the limits of their capabilities. The health officer has asked for a return visit within a year to work further on the plans and procedures.

#### AIDS TO DISCUSSION OF NATIONAL HEALTH INSURANCE

"Platform" is a special bulletin of the *Newsweek Magazine* prepared for women's clubs in all parts of the country. The December, 1946, issue has an outline of the pros and cons of National Health Insurance suitable for club discussions of the subject. In preparing the bulletin *Newsweek* had the assistance of the Committee for the Nation's Health, which is quoted at length in the bulletin. Available without charge from Newsweek Club

Bureau, 125 W. 42nd Street, New York 18.

#### RADIO CANCER FORUM

The Nassau County (N. Y.) Cancer Committee broadcast a Public Cancer Forum recently as a part of its Ninth Annual Cancer Institute. This was a sponsored program without advance knowledge of the panel speakers' texts by either sponsor or station. Questions from both the visible and radio audience were answered by the panel representing specialists in cancer of the breast, female genital organs, digestive tract, head and neck. It is reported that the public reaction has been uniformly enthusiastic, with an unmistakable preference for this audience participation type of program over the traditionally didactic cancer lecture.

#### COMMITTEE FOR KENTUCKY

"The Committee for Kentucky" is a fact-finding organization that has as its only objective the welfare of all of Kentucky. This committee has been publishing a series of reports the third of which is on health. Written by the state health officer, Philip E. Blackerby, M.D., it is a simple and highly effective stocktaking of Kentucky's health service with no slurring over of the unmet needs. Its first item for example is "Kentucky has the third highest tuberculosis death rate in the nation." The Plan of Action, proposed by O. O. Miller, M.D., Immediate Past President of the Kentucky State Medical Association, outlines the several immediate steps that need to be taken with regard to each of 13 problems—tuberculosis, sanitation, dental health, and others. For public health organization there is just one suggestion—"establish full-time health units in every county and provide for their adequate financial support."

It is an effective piece of public health education with bright and colorful

charts simply drawn. The entire series should do much to change the sociological map of Kentucky.

#### AMERICAN STANDARDS FOR 1947

The American Standards Association announces the publication of the 1947 edition of *American Standards*, dated January, 1947. Listed are 864 standards approved for national use by industry. Included in the standards are definitions of technical terms, specifications for metals and other materials, methods of work and methods of test for finished products. "They reach into every important engineering field. They also include standards dealing with public and industrial safety, industrial medicine, and a wide variety of consumer goods." Copies can be obtained from the American Standards Association, 70 East 45th St., New York 17, N. Y.

#### MINNESOTA'S NEW HEALTH DEPARTMENT BULLETIN

January saw the launching of *Minnesota's Health*, a monthly news bulletin of the Minnesota State Department of Health. This first issue tells of the streamlining of the state's health department through a reorganization into five sections to replace the nine divisions under which it previously operated. Section chiefs are as follows:

Departmental Administration: R. N. Barr, M.D., M.P.H.

Preventable Diseases: D. S. Fleming, M.D., M.P.H.

Medical Laboratories: Paul Kabler, M.D., M.P.H.

Environmental Sanitation: Herbert M. Bosch, M.P.H.

Special Services: Viktor O. Wilson, M.D., M.P.H.

The same issue tells also of the organization of the Minnesota Committee on Local Health Service under the chairmanship of William B. Pearson, Master of the State Grange of Minnesota. This committee, widely repre-

sentative of professional and citizen groups, has drafted a permissive health unit bill which "if enacted, will make possible the establishment of local health services and the employment of full-time health officers and other necessary personnel by all Minnesota communities that want them."

Congratulations to the new bulletin and its editor, Netta W. Wilson of the Minnesota Health Department's Public Health Education Unit.

#### ODORS—AND ODORS

The Hospital Bureau of Standards and Supplies (247 Park Avenue, New York 17) throws a salutary dash of cold water on the magic compounds that will give air "country air freshness." In a recently published pamphlet, *The Problem of Odors in Institutions*, by Dewey H. Palmer, it declares that good ventilation and frequent cleaning are still the best solution of the odor problem, that the widely sold deodorizers merely substitute one odor for another.

Activated carbon is the only generally available substance that can adsorb odors in large quantities. There are two present methods based on the use of activated carbon adaptable against odors from putrefaction. One is a mechanical device, the other is a medicated filter cloth.

#### GREENWICH STARTS A HEALTH BULLETIN

In October, 1946, there appeared Vol 1, No. 1 of the *Greenwich Health Bulletin*, published by the Greenwich (Conn.) Tuberculosis and Health Association. Designed as a quarterly, its first issue gives this reason for its existence: "In our community there seems to be no lack of private and public services which directly and indirectly safeguard our health. The greatest need appears to be better knowledge and appreciation of all services available."

## BOOKS AND REPORTS

*All reviews are prepared on invitation. Unsolicited reviews cannot be accepted. All books reviewed in these columns may be purchased through the Book Service.*

**Dentistry: An Agency of Health Service**—By *Malcolm Wallace Carr*. New York: *The Commonwealth Fund*, 1946. 219 pp. Price, \$1.50.

*Dentistry* is one in a series of monographs issued under the auspices of the Committee on Medicine and the Changing Order of the New York Academy of Medicine.

Writing for the intelligent layman, Malcolm Carr and a group of prominent contributors describe the history of the dental profession, dental education, dental practice, research, and dental socio-economics. Summary and conclusions representing the thinking of dental authorities will merit the consideration of public health leaders. "The autonomous dental profession," says the author, "has acquired special competence in the related sciences and arts of dental health care." The author then adds that "a recent survey has indicated that medical faculties are inattentive to the principles of oral pathology related to systemic diseases and to the clinical aspects of the diseases of the mouth."

It is surprising how much data and how much authentic information concerning dental health have been included in the comparatively few pages of this volume.

In describing the status of organized dentistry, the author urges the dentist of tomorrow to have "a broader scientific and public health background." Your reviewer goes a step further by suggesting that public health personnel obtain a broader and more comprehensive background of dental

health as it is related to public health.

Admittedly one book, even one so well written as is *Dentistry*, will not of itself bring about the desired changes in the thinking of dentists and public health administrators. Nevertheless its wide reading in both professions should enhance the social utility of the dental profession.

J. M. WISAN

**Insect Microbiology**—By *Edward A. Steinhaus*. Ithaca, N. Y.: *Comstock Publishing Company*, 1946. 763 pp. Price, \$7.75.

The extremely varied associations between insects and microorganisms (including viruses) are grouped by Dr. Steinhaus in ten categories, each of which forms a separate chapter. On account of the closely similar conditions seen in ticks, especially in their activity as vectors of disease, these other arthropods are included.

The first two chapters deal with extracellular bacteria and specific bacteria associated with insects, including many references to species pathogenic to insects, as well as human pathogens that occur sporadically in insects or on their bodies. An account of the remarkable bacterium-like and rickettsia-like symbiotic organisms which occur intracellularly in diverse insects forms the fourth chapter. Following this is an extensive treatment of the rickettsias of ticks and insects. This includes much material on the difficult and complex problems presented by the rickettsial diseases of man. A chapter on yeasts is devoted mainly to a consideration of the yeast-like symbionts that oc-

cur chiefly in the sap-sucking insects of the order Homoptera. Following this the much more diverse relations of insects with fungi are discussed, including parasitic forms, those serving as food for insects and those fungous parasites of plants which are disseminated by insects. A chapter on viruses deals mainly with those causing diseases in insects and with those concerned in diseases of other animals and plants which are spread by insect vectors. Two chapters relate to Protozoa, one dealing entirely with the peculiar symbiotic flagellates of termites. Finally there is a chapter on immunity, a long and very well selected bibliography of nearly 90 pages, and a complete index.

Dr. Steinhaus has presented a vast amount of material not hitherto available in correlated form, which will be highly useful to a wide audience of entomologists and biologists in general, including pathologists, human and otherwise.

CHARLES F. BRUES

**Manual of Applied Nutrition—**  
*Compiled by H. Baughman, K. M. Lewis, and E. R. Trescher (rev. ed.). Baltimore: The Johns Hopkins Hospital, 1946. 103 pp.*

This is a technical manual describing routine dietary procedures in The Johns Hopkins Hospital. It was compiled for the use of medical, nursing, and dietary staffs of the hospital. The first edition was published in 1940 and has been recently revised by representatives of several clinical departments and the nutrition committee of the hospital.

A comprehensive group of therapeutic diet plans have been included in this manual. Each outlines the approximate composition of the diet and a one day pattern meal plan. Normal dietary needs are briefly outlined and have been used as a basis for planning all therapeutic diets. Also included are diets during pregnancy and lactation.

infant feeding regimes, and normal diets for children of various ages. The diets for children are well adapted to hospital procedure but would require more flexible interpretation for the child at home. This reviewer feels that the emotional factors as a component of diet therapy have not been given sufficient emphasis.

The committees revising the manual say, "We have attempted to describe the routine dietary procedures as they are practised in this institution and to show that so-called special diets are usually simple modifications of the normal diet. It has been our purpose to present the necessary material in as brief a fashion as is consistent with clarity. In view of this, we have not permitted ourselves to indulge in discussion. It is hoped that many will be stimulated to review for themselves the basic facts of physiology, pathology and nutrition which have been given consideration in the compilation of this material."

This is in the true sense of the word a manual and would seem to be of limited value to public health workers not directly associated with this hospital. The manual would be useful, however, as a reference for the clinical and dietary staff members of other hospitals.

ANSTA TODD BARR

**Personnel Policies for Public Health Nursing Agencies—**  
*Prepared by the Committee on Personnel Policies of the National Organization for Public Health Nursing, 1946. New York: N.O.P.H.N., 1946. 31 pp. Price, \$.75.*

This Guide on personnel policies for public health nursing agencies contains 31 pages, compiled in loose-leaf form so that pages may be replaced as changes are indicated, and individual agencies may insert copies of their own policies and other related materials. The recommended policies are clearly and concisely stated and were determined

on the basis of current and practical standards in personnel practice. They cover time, salaries, transportation, health program, staff development, staff council, uniforms, retirement plans, termination of services, and student program; also general principles and methods to be considered in establishing personnel policies.

The Guide points clearly to the need for defining personnel policies and should prove helpful to all agencies employing public health nurses. While much of the material will apply only to the nursing staff, the basic principles are applicable to personnel policies for all workers in public health agencies.

HELENE B. BUKER

**The Day Care of Little Children in a Big City—***By Leona Baumgartner, M.D., et al., and Daytime Care—A Partnership of Three Professions—New York: Child Welfare League of America, Inc., 1946. Price, \$.50 and \$.35.*

It is to be hoped that the experiment described by the first of these pamphlets will not long remain unique. For while the day care problem in New York City is on a scale unapproached elsewhere, the nature of the difficulties of providing for children whose mothers are working outside their homes is much the same in all large cities. Many cities must, as a result of their immensely increased load during the war, be in process of reviewing the situation thus brought sharply to their attention.

It had long been recognized in New York that three public departments had a stake in day nurseries: the Health Department, the Department of Education, and that of Social Welfare. But only the Health Department had legal authority behind it, and what authority it did possess applied only to sanitation, building standards, fire hazards, and disease prevention.

Only after a survey in 1942 of the

city's facilities brought to light that close to 500 agencies were giving day care to children under 6 did things begin to move. Experts from all the fields concerned, called together by the Director of the Bureau of Child Hygiene, framed and proposed recommendations greatly broadening the scope of inspection standards. Evaluation was proposed in terms of the *total* care given the children. In other words, mental health took its proper place alongside physical health; and a coordinated plan for putting to work the findings about what is necessary to the best growth and development of children came into being.

This plan, as finally worked out, set up a Day Care Unit in the Health Department's Bureau of Child Hygiene. The move was the result of consultation among a widely representative group of interested organizations, such as the Welfare Council and The Mayor's Committee on the Wartime Care of Children.

Both public and private help were provided, resulting in a staff of 6 professional workers (the director from the nursery education field), later increased to 9. With additional help from the State Departments of Social Welfare and Education, and from professionally trained volunteers, every day care center was inspected, advised and, in cases where it was necessary, either closed or given help in reaching higher standards. That in the second year of operation 47 centers closed, as against 70 the first year, suggests that fewer ill-prepared persons and organizations were attempting to undertake day care; a testimonial to the careful interviewing of prospective licensees. Only two court actions were necessary, to close undesirable places, but these undoubtedly had the effect of motivating efforts to bring others up to standard.

At least 50 per cent of the children receiving day care are in centers oper-

ated for profit, only one of the many reasons why it will be necessary for the day care unit to continue functioning.

In order to give children the care they are entitled to—far above the old concept of custodial care—only a team of experts, pooling their knowledge about children's needs—emotional, social and physical—and constantly striking out for new gains, can do the job. Supervision at the present time is far below what those with children's interests at heart would like to have it be. Among the far-reaching possibilities that have had to be left untouched, up to now, is the development of methods of working with the parents of these thousands of young children.

The second pamphlet, *Daytime Care*, is the outcome of a tri-professional conference on day care held by the Child Welfare League in 1945. Into it is packed the result of such soundly coordinated effort that it should be widely used in schools of nursing, public health, pediatrics, social work, and nursery education. It would be invaluable as a means of implementing any such effort as that described in the first pamphlet. KATHERINE BAIN

**Manual of Recommended Practice for Sanitary Control of the Shellfish Industry—Public Health Bulletin No. 295.** Washington: U. S. Govt. Ptg. Office, 1946. 44 pp. Price, \$.15.

This *Bulletin* was prepared by the U. S. Public Health Service as a guide to the shellfish industry and regulatory agencies responsible for shellfish sanitation, and represents the experience of the Service during twenty years of this work.

The *Bulletin* is very carefully indexed, includes useful definitions, and covers every phase of shellfish sanitation from the problems of growing areas, harvesting and handling, expressing and interpreting of laboratory results, details of construction, opera-

tion, and maintenance of shucking, packing, and shipping plants.

Each subject is divided into three main headings—(1) a statement of the recommendation or requirement, (2) the public health reason for the requirement, and (3) a statement of what constitutes satisfactory compliance with the requirement.

This *Manual* will be found extremely valuable and helpful to both the industry and those engaged in regulating the industry. It should provide a medium for a more uniform practice in shellfish sanitation than was possible previously.

M. H. BIDWELL

**Proceedings and Papers of the Fourteenth Annual Conference of the California Mosquito Control Association—Edited by Harold Farnsworth Gray.** Berkeley, Calif.: Issued by the Association, 1946. 115 pp. (mimeo.). Price, \$1.50.

These proceedings include 19 papers dealing with various phases of mosquito control, presented chiefly by workers in this field in California. Over half of the papers discuss the use of DDT, methods for its distribution by both ground and air apparatus, its toxicity to harmful and beneficial insects, its effect upon fish and wildlife generally, and its hazards to man.

The California state program for control of mosquito-borne diseases is described. Special emphasis is to be placed on gathering information on the distribution and biology of mosquitoes known to be vectors of encephalitis and malaria. Under a Bill pending in the Legislature, the Department of Health is authorized to coöperate with local mosquito abatement districts in furthering mosquito control. Financial assistance not to exceed 50 per cent of the total cost of any acceptable plan may be provided by the department on behalf of the state. The Bill calls for an appropriation of \$600,000.



Reports of accomplishments by mosquito abatement districts are given, together with discussions of problems encountered during the year.

The proceedings contain a wealth of current information of value and interest to public health workers engaged in mosquito and other insect control work.

GEORGE H. BRADLEY

*The Health Instruction Yearbook, 1946—Compiled by Oliver E. Byrd, Ed.D. Stanford, Calif.: Stanford University Press, 1946. 399 pp. Price, \$3.00.*

Three times in the last two volumes of our *Journal*, the annual editions of this *Health Instruction Yearbook* have been praised by reviewers. The first concluded judiciously, "As a source book, this volume . . . should find a place in every health educator's library." The second began, exuberantly, "Here it is! A book . . . every health officer . . . should add to his, or her, group of essential personal desk references." (The last dots represent varieties of health workers too numerous to list here.) The third reviewer, purse-mouthed, sums up the 1945 edition, "The *Yearbook* seeks to keep abreast the rapidly changing developments and problems in public health, medicine, and allied areas, and succeeds very well indeed."

Now the fourth edition claims your patronage through our Association's Book Service. Instead of piling another Ossa of eulogy upon this Pelion of praise, it seems more profitable to try to tell you just what this hardy perennial is. But, first, what it isn't! It isn't a handy reference volume of the health literature of 1946. It couldn't possibly attempt the task. A book the size of Webster, unabridged, couldn't hold it all.

In the *Yearbook*, the author summarizes the advances in public health as reported between the first of September of the preceding year and the last of

August of the current year of review. To do this he abstracts (in the 1946 edition) 384 articles from 83 different sources. He groups the items in 21 categories, beginning with social accomplishment and social problems, through the usual hygienic rubrics—nutrition, infectious and chronic diseases, safety and the like—ending with community services, trends, and (new) international health.

At the beginning of each category he epitomizes the abstracts to be grouped there. Each item has, of course, a reference to the source and each is written in readable English—not abstractese!

The author accomplishes what he sets out to do. He presents a comprehensive, orderly picture of what has been going on in the (health) world. If you want to relate your work and your self with the moving tide of affairs, then reading this *Yearbook* will be a rewarding—and a pleasant—experience.

RAYMOND S. PATTERSON

*American Foundations for Social Welfare—By Shelby M. Harrison and F. Emerson Andrews. New York: Russell Sage Foundation, 1946. 249 pp. Price, \$2.00.*

Students of public health will do well to note this new volume descriptive of American foundations and sure to be helpful to those who want to make contacts with such agencies for any purpose.

The heart of the volume is a directory of 505 foundations. Chapters on financial aspects, fields of activity, trends and possible developments round out the story. Taken together with the publication of the Raymond Rich Associates in 1942—*American Foundations and Their Fields*, 5th edition, we now have available adequate studies of American foundations.

According to this report, one hundred and twenty-nine foundations, or

38.5 per cent, indicate that health is a major concern, forty foundations regard health—or one of its sub-heads such as mental hygiene and the care of the handicapped—as the sole major interest. Foundation interest in health is exceeded in this survey by interest in the fields of education and “social welfare.”

The latter term, however, is recognized as a catch-all.

A reader of this work will wonder whether society will long tolerate the tax-free foundation which refuses to divulge the manner in which it spends its funds.

REGINALD M. ATWATER

## BOOKS RECEIVED

*Listing in this column acknowledges the receipt of books and our appreciation to the senders. Space and the interests of readers will permit review of some, but not all, of the books listed.*

- ACCIDENT PREVENTION MANUAL FOR INDUSTRIAL OPERATIONS—National Safety Council. Chicago: National Safety Council, 1946. 534 pp. Price, \$14.00 (\$7 to members of National Safety Council).
- ADJUSTMENT TO PHYSICAL HANDICAP AND ILLNESS: A SURVEY OF THE SOCIAL PSYCHOLOGY OF PHYSIQUE AND DISABILITY—By Roger G. Barker, Beatrice A. Wright and Mollie R. Gonick. New York: Social Science Research Council, 1947. 372 pp.
- ANNUAL REPORT OF THE DIVISION OF LABORATORIES AND RESEARCH. By Gilbert Dall-dorf, M.D. Albany: New York State Department of Health, 1945. 111 pp.
- BABY—A MOTHER'S MANUAL. By Stella B. Appelbaum. Chicago: Ziff-Davis, 1946. 118 pp. Price, \$2.50.
- BOVINE MASTITIS—A Symposium. Edited by Ralph B. Little and Wayne N. Plasteridge. New York: McGraw-Hill, 1946. 546 pp. Price, \$7.00.
- BEAUTY PLUS. By Mary MacFadyen, M.D. New York: Emerson Books, Inc., 1947. 272 pp. Price, \$2.49.
- THE COMPLEAT PEDIATRICIAN. By Wilburt C. Davison, M.D. (5th ed.) Charlotte, N. C.: Duke University Press, 1946. 256 numbered items. Price, \$3.75.
- THE CULTIVATION OF VIRUSES AND RICKETTSIAE IN THE CHICK EMBRYO. By W. I. B. Beveridge and F. M. Burnet. London: His Majesty's Stationery Office, 1946. 92 pp. Price, \$6.00.
- DANIEL COIT GILMAN. By Abraham Flexner. New York: Harcourt, Brace & Company, 1946. 173 pp. Price, \$2.00.
- DIRECTORY OF BIOLOGICAL LABORATORIES WITH BUYERS' GUIDE. Chicago: Burns Compiling and Research Organization, 1946. 120 pp. Price, \$3.00.
- EMPLOYMENT, REHABILITATION AND VETERAN ADJUSTMENT—A Bibliography, 1940-1945. By Paul S. Burnham. Chicago: Public Administration Service, 1946. 27 pp. Price, \$1.00.
- ESSENTIALS OF PHYSIOLOGICAL CHEMISTRY. By Arthur K. Anderson. (3rd ed.) New York: Wiley, 1947. 395 pp. Price, \$3.50.
- FACTS ABOUT NURSING. Nursing Information Bureau. New York: Nursing Information Bureau, 1946. 112 pp. Price, \$35.
- FOOD AND HEALTH. By Henry C. Sherman. New York: Macmillan, 1947. 290 pp. Price, \$4.00.
- FUNDAMENTALS OF SEMI-MICRO QUALITATIVE ANALYSIS. By Carl J. Engelder. New York: Wiley, 1947. 385 pp. Price, \$3.50.
- GUARDING YOUR HEALTH IN 1946. By Arthur L. Ringle, M.D. Seattle: Washington State Department of Health. 28 pp.
- GROUND WATER IN THE BALTIMORE INDUSTRIAL AREA. By John C. Geyer. Baltimore: Maryland State Planning Commission, 1945. 299 pp. Price, \$1.00.
- HEALTH AND BODY BUILDING. By Frank Merrill Wheat and Elizabeth T. Fitzpatrick. New York: American Book Company, 1947. 517 pp. Price, \$2.08.
- HOSPITAL RESOURCES AND NEEDS. The Report of the Michigan Hospital Survey. Battle Creek, Michigan: W. K. Kellogg Foundation, 1946. 172 pp.
- HOW TO LIVE. By Irving Fisher and Haven Emerson. (21st ed.) New York: Funk & Wagnalls, 1946. 354 pp. Price, \$2.50.
- HOW TO OBSERVE PUBLIC HEALTH NURSING WEEK APRIL 20-26, 1947 IN YOUR COMMUNITY. National Organization for Public Health Nursing. New York: N.O.P.H.N., 1947. Price, \$.50.

- IMPROVISED EQUIPMENT IN THE HOME CARE OF THE SICK (4th ed.). By Lyla M. Olson. Philadelphia: W. B. Saunders, 1946. 265 pp.
- INTERIM REPORT OF THE COUNTY MEDICAL OFFICER OF HEALTH AND SCHOOL MEDICAL OFFICER FOR THE YEAR 1945. By Sir Allen Daley, M.D. London: London County Council, 1946. 64 pp.
- MANUAL FOR PUBLIC HEALTH NURSES 1947-48 AND PUBLIC HEALTH NURSING FUNCTIONS IN THE SCHOOL HEALTH PROGRAM. Minnesota Department of Health, 1946.
- THE NATIONAL CONFERENCE ON PREVENTION AND CONTROL OF JUVENILE DELINQUENCY. Department of Justice. Washington: U. S. Gov. Ptg. Office, 1947. 136 pp. Price, \$3.30.
- THE PHYSIO-CHEMICAL MECHANISM OF NERVE ACTIVITY. By David Nachmansohn, et al. New York: The New York Academy of Sciences, 1946. Price, \$3.00.
- PHYSICAL EXAMINATIONS OF SELECTIVE SERVICE REGISTRANTS IN THE FINAL MONTHS OF THE WAR. Selective Service System, 1946. 102 pp.
- POLIOMYELITIS—A Source Book for High School Students, and Teachers Guide in the Use of a High School Unit on Poliomyelitis. National Foundation for Infantile Paralysis.
- THE PRESERVATION OF PROTEINS OF DRYING. By R. I. N. Greaves. London: His Majesty's Stationery Office, 1946. Price, \$60.
- PROCEEDINGS OF THE CONFERENCE ON PREVENTIVE MEDICINE AND HEALTH ECONOMICS. University of Michigan. Ann Arbor, Mich.: University of Michigan, 1947. 245 pp.
- RADIO—HOW, WHEN AND WHY TO USE IT. By Beatrice K. Tolleris. New York: National Publicity Council, 1946. 48 pp. Price, \$1.00.
- REPORT OF THE FIRST SESSION OF THE CONFERENCE. Food and Agriculture Organization of the United Nations. Washington, 1946. 89 pp.
- A REPORT OF THE MISSOURI CHILDREN'S CODE COMMISSION. Missouri Children's Code Commission. Jefferson City, Mo.: Mid-State Printing Co., 1946. 138 pp.
- THE SCHOOL ADMINISTRATOR, PHYSICIAN AND NURSE IN THE SCHOOL HEALTH PROGRAM. National Conference for Coöperation in Health Education.
- STANDARD METHODS FOR THE EXAMINATION OF WATER AND SEWAGE. New York: American Public Health Association, 1946. 286 pp. Price, \$4.00.
- STATE CHILD-LABOR STANDARDS. By Lucy Manning and Norene Diamond. Washington: U. S. Dept. of Labor, 1946. 182 pp.
- THE STORY OF HUMAN BIRTH. By Alan Frank Guttmacher, M.D. New York: Penguin Books, Inc., 1947. 214 pp. Price, \$25.
- TEACHING AIDS ON TUBERCULOSIS AND ITS PREVENTION (Bulletins 1-6 incl.). Department of Education and Department of Health. Juneau, Alaska: Territorial Department of Health, 1946.
- TEXTBOOK FOR PSYCHIATRIC ATTENDANTS. By Laura W. Fitzsimmons. New York: Macmillan, 1947. 332 pp. Price, \$3.50.
- UTERINE CONTRACTILITY IN PREGNANCY. By Douglas P. Murphy. Philadelphia: Lippincott, 1947. 134 pp. Price, \$5.00.
- VITAMINS AND HORMONES (Vol. IV). Edited by Robert S. Harris and Kenneth V. Thimann. New York: Academic Press, 1946. 406 pp. Price, \$6.80.
- VITAL STATISTICS OF THE UNITED STATES. By Halbert L. Dunn, M.D. U. S. Department of Commerce. Washington: U. S. Gov. Ptg. Office, 1946. 846 pp.
- WHAT DO YOU KNOW ABOUT BLINDNESS? By Herbert Vahraes. New York: Public Affairs Committee, 1947. 32 pp. Price, \$10.
- YOUR COMMUNITY — ITS PROVISION FOR HEALTH EDUCATION, SAFETY, WELFARE (3rd ed. rev.). New York: Russell Sage Foundation, 1947. 263 pp. Price, \$1.50.
- YOUR RHEUMATISM AND BACKACHES. By Joseph D. Wassersug, M.D. New York: Wilfred Funk, Inc., 1947. 310 pp. Price, \$2.50.

## A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

**Gay Hymeneal Note**—Combined here are the first and last sentences of an interesting statistical summary. "Marriages in the United States reached an all-time high in 1946 . . . it does not appear likely that the marriage record established will be reached again for many years to come." The cause seems to be, mostly, delayed "intin-tions," as we say in Boston.

ANON. 1946—A Peak Year for Marriages. Stat. Bull. (Met. Life Ins. Co.). 27, 12:1 (Dec.), 1946.

**Canadian Inspector Speaks Out**—Privileged heads roll right and left in this chief inspector's uninhibited plea to health workers generally to take an active part in demanding a Federally subsidized housing program to provide decent dwellings for low income groups. Is it possible that the housing situation this side of the border calls for some out-speaking, too, on our part?

AUSTIN, F. C. The Real Housing Problem. Canad. Pub. Health J. 37, 12:488 (Dec.), 1946.

**Research, Training and Community Services**—More than eight million Americans endure some form of mental illness and 600,000 of them are now in mental hospitals. Health officers join with the psychiatrists to see what can be done about this poser. Whatever your job, this is something you, too, should be concerned about.

FELIX, R. H. The Relation of the National Mental Health Act to State Health Authorities. Pub. Health Rep. 62, 2:41 (Jan. 10), 1947.

**Therapeutic Pitfalls: Public Health Hazards**—Though these sound warnings about the limitations of

penicillin therapy of syphilis are mostly medicine, certain public health aspects of the problem are not neglected. The returned veteran, the question of marriage, the dangers of hidden infections, among others, are discussed and these are of moment to you.

HILL, W. R. Problems Arising in the Treatment of Syphilis with Penicillin. New England J. Med. 235, 26:919 (Dec. 26), 1946.

**Preliminary Report**—You should know about some forms worked out to facilitate notification of venereal disease contacts and sources of infection. They proved acceptable to practising physicians who had formerly been reluctant to collaborate, and despite obvious weaknesses, seem to work.

HOLLISTER, W. G. Self-Interview Forms in Private Physician Contact Reporting—A New Technic in Case Finding. J. Ven. Dis. Inform. 27, 10:240 (Oct.), 1946.

**"Report Immediately"**—Let the Western Union messenger be your case chaser-upper! That's the suggestion of this paper in which the claim is made that he is effective and economical.

KOCH, R. A., and THORNTON, M. Use of Telegrams in Venereal Disease Case Holding. J. Ven. Dis. Inform. 27, 10:246 (Oct.), 1946.

**More about DDT**—Three papers add to your knowledge of DDT. Blown into rat harborages and runways, DDT rids rats of fleas. Sprayed on building interiors it tends to discourage anophe-line mosquitoes from entering and biting after they enter. It also proves a useful laticide for anophelines.

LUDWIG, R. G., and NICHOLSON, H. P. The Control of Rat Ectoparasites with DDT (and two other papers). Pub. Health Rep. 62, 3:77 (Jan. 17), 1947.

**Tip to Historians** — All proper treatises on public health begin "at the beginning" with Edwin Chadwick, Father of Sanitation. If we are to believe this paper, the beginnings began before Chadwick, for Sir Thomas More (1478-1535) in his *Utopia*, provided a blue print for community health administration. In addition to his flights of literacy fancy, he was appointed by the king to work out some down-to-earth health measures to control the ever present plagues of his day. Codified, these orders survived him as accepted sanitary methods.

MACNALTY, A. S. Sir Thomas More as Public Health Reformer. *J. Roy. Inst. Pub. Health & Hyg.* 10, 1:7 (Jan.), 1947.

**Tuck This Away** — Recently a crystalline substance was isolated from a lichen; it can be administered daily without toxic effects and, when so given to guinea pigs infected with human tubercle bacilli, it seemed to retard the progress of the disease. So the search goes on for new antibiotics, to supplement or perhaps supercede streptomycin.

MARSHAK, A. A Crystalline Antibacterial Substance from the Lichen *Ramalina reticulata*. *Pub. Health Rep.* 62, 1:1 (Jan. 3), 1947.

**Valuable Screening Mechanism** — This quotation should tell you whether or not you will want to study the paper from which it was taken. "The smear diagnosis (of cancer of the cervix and the uterus) is important and its value has been definitely settled. . . ."

MEIGS, J. V. The Vaginal Smear. *J.A.M.A.* 133, 2:75 (Jan. 11), 1947.

**Would Hospital Licensure Help?** — Hospitals continue to be plagued with that most heartless of all public health tragedies, infectious diarrhea—in Massachusetts as elsewhere. Epidemiologic investigations reveal inexcusably lax techniques. Neither the cause nor the mode of transmission is known, but greater attention to this hazard by hospital administrators could accomplish wonders, say these writers.

RUBINSTEIN, A. D., and FOLEY, G. E. Epidemic Diarrhea of the New Born in Massachusetts. *New England J. Med.* 236, 3:87 (Jan. 16), 1947.

# ASSOCIATION NEWS

SEVENTY-FIFTH ANNUAL MEETING  
AMERICAN PUBLIC HEALTH ASSOCIATION  
ATLANTIC CITY, N. J., OCTOBER 6-10, 1947

## APPLICANTS FOR MEMBERSHIP

*The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.*

### *Health Officers Section*

J. L. Murray Anderson, M.D., D.P.H., Health Dept., City Hall, Victoria, B. C., Can., Medical Health Officer, Victoria-Esquamalt Health Service  
Elmer E. Bertolaet, M.D., 176 E. 2nd St., Fond du Lac, Wis., District Health Officer, State Board of Health  
Arthur R. Daviau, M.D., City Bldg., Waterville, Me., City Health Officer  
Robert Esty, Glen Ridge Health Dept., Glen Ridge, N. J., Health Officer  
Leslie A. Falk, M.D., 790 Clemont Drive, N.E., Atlanta, Ga., Chief, Health Services Division, S.E. Region, Labor Branch, U. S. Department of Agriculture  
Gerald F. Kempf, M.D., 307 City Hall, Indianapolis 4, Ind., Director of Public Health, Board of Public Health and Hospitals  
Raoul D. Landry, M.D., 28 Alma St., Moncton, N.B., Can., District Medical Health Officer, New Brunswick Dept. of Health  
Bernardo A. Limlingan, M.D., U. S. Marine Hospital, Carville, La., A. A. Surgeon, U. S. Public Health Service  
Elbert S. Parmenter, M.D., 208 Third St., Rogers City, Mich., Director, District Health Dept., No. 4  
Ardax Vahan Tajirian, Medical Dept., Iraq State Railways, Kirkuk, Iraq, Senior Health Official in charge of Railway Dispensary  
R. G. Tuck, M.D., 2401 Fourth, Royal Oak, Mich., Medical Director, District No. 2  
Frank E. Wheelon, M.D., District No. 1 Health Unit, Minot, N. D., District Health Officer

### *Laboratory Section*

Victor H. Bertullo, D.V.M., Estero Bellaco 2588, Montevideo, Uruguay, S. A., Sanitary Inspector, Bureau of Cattle, Cattle and Agricultural Dept.

Major W. N. Christopher, Sn.C., Shanghai Detachment Hospital, Station Comp, AAG, APO 917, San Francisco, Calif., Chief of Laboratory Service and Preventive Medicine  
Helen Fitzgerald, 599 Bedford Rd., Pleasantville, N. Y., Asst. Bacteriologist, Westchester County Dept. of Laboratories and Research, Valhalla, N. Y.  
Floyd W. Hartmann, Sc.D., University of Hawaii, Honolulu 10, T. H., Chairman, Bacteriology Dept.  
Joseph M. Hodges, 306 Hoke Bldg., Hutchinson, Kans., Clinical Pathologist and Medical Technologist, The Dupray Laboratory  
Peter C. Issaris, M.D., 615 N. Wolfe St., Baltimore, Md., District Malarologist, Athens School of Hygiene, Athens, Greece  
Marshall Levin, 58 Westland Ave., S-14, Boston, Mass., Bacteriologist, Skinner and Sherman Inc.  
Dr. Alberto Montoya, Mount Sinai Hospital, New York, N. Y., Volunteer Asst. in Pathology  
Juanita Powell, Box 983, College Station, Columbus, Miss., Part-time worker on Milk and Water Analysis, State Board of Health  
Hazel V. Roberts, 25 Woodlawn Ave., Albany 3, N. Y., Junior Analytical Chemist, Div. of Laboratories and Research, State Dept. of Health  
Edmund E. Staley, 832 El Caminito, Santa Fe, N. M., Senior Medical Laboratory Technician, Health Laboratory, University of California, Los Alamos, N. M.  
Martha Wilkerson, M.A., 202 W. 38th St., Austin, Tex., Assoc. Immunologist, State Dept. of Health

### *Vital Statistics Section*

Sidney J. Cutler, M.A., 989 Fox St., New York 59, N. Y., Senior Statistician, City Dept. of Health

- Margaret M. Fenigson, 286 High St., Passaic, N. J., Statistician
- Sara Lou Hatcher, M.A., Thompson Station, Tenn., Junior Statistician, State Dept. of Public Health
- Jorge M. deLeon, National Office of Vital Statistics, Washington 25, D. C., Staff Member, Bureau of Statistics, Guatemala City
- Claire Lingg, M.A., 2 E. 103rd St., New York 29, N. Y., Research Statistician, New York Heart Assn.
- Adele K. Polansky, M.A., 325 State St., Albany 6, N. Y., Statistician, State Dept. of Health
- Otto R. Pozdena, M.D., Bureau of Records, 125 Worth St., New York 13, N. Y., Acting Registrar and Director, Bureau of Records, City Health Dept.
- Philip G. Rettig, LL.B., 5458 Lieb Ave., Chicago, Ill., Director of Research and Legislative Services, National Society for Crippled Children and Adults, Inc.
- Robert C. Strauss, 3541 39th St., N.W., Washington, D. C., Statistician, National Office of Vital Statistics
- Lola Mai Upchurch, 420 Sixth Ave., N., Nashville, Tenn., Junior Statistician, State Dept. of Public Health

#### *Engineering Section*

- Ralph H. Baker, Jr., 192 Bartlett Rd., Winthrop 52, Mass., Graduate Student in Sanitary Engineering, Massachusetts Institute of Technology
- F. Rodwell Blaisdell, M.S., 67 Otis St., Bangor, Me., Chief Sanitary Engineer, Institute of Inter-American Affairs, Bolivia, S. A.
- Wilson F. Brown, P. O. Box 14, Forsyth, Ga., Sanitarian, State Dept. of Public Health
- James H. Drake, P. O. Box 510, Moultrie, Ga., Sanitarian, Colquitt County Health Dept.
- Clyde B. Eller, 802 Hodge Ave., Ames, Iowa, Student, School of Public Health, University of Michigan
- Miguel A. Fernandez-Sandoval, Design Sec. Antilles Dis. Eng. Office, P. O. Box 406, San Juan, P. R., Assoc. Engineer
- Stanley J. Goldschmidt, City Offices, Beloit, Wis., Sanitarian
- James H. Harris, P. O. Box 1013, Lubbock, Tex., Sanitarian, U. S. Public Health Service
- Donald Hernandez, Roselle, Ill., Student, School of Public Health, University of Michigan
- William M. Honsa, 51 Fox St., Aurora, Ill., District Sanitary Engineer, State Dept. of Public Health
- Emil C. Jensen, M.S., 1405 Smith Tower, Seattle 4, Wash., Chief, Division of Public

- Health Engineering, State Dept. of Health
- Eduardo Joubanc, Colonia Peralta Casa No. 6, Tampico, Tamaulipas, Mex., Director of Sanitary Engineering, Tamaulipas State
- Reinhart W. Koch, M.P.H., 118 Miller Ave., Ann Arbor, Mich., Student, School of Public Health, University of Michigan
- George F. Maul, 3248 Oregon Ave., St. Louis 18, Mo., Sanitarian, Dept. of Public Welfare, City Health Division
- Samuel Mendlowitz, 219 Scholes St., Brooklyn 6, N. Y., Student, School of Public Health, Univ. of Michigan
- H. Clifford Mitchell, 1014 E. Broad, Richmond, Va., Chief, Bureau of Sanitation, Richmond Health Dept.
- Dixon R. Olive, Jr., Box 510, Moultrie, Ga., Public Health Engineer, Colquitt-Brooks County Unit
- Rufus A. Roberts, D.V.M., Hamilton Rd., LaGrange, Ga., Sanitarian, Troop County Health Dept.
- Harry A. Smith, 513 Sante Fe Bldg., Dallas, Tex., Dining Car Inspector, U. S. Public Health Service, Dist. No. 9
- John P. Smouse, 4785 Munger Rd., Ypsilanti, Mich., Student, School of Public Health, University of Michigan
- Oba Preston Stiewig, 413 Willow, Duncan, Okla., Sanitarian, Stephens County Health Dept.
- Dean M. Taylor, 2845 S. 43rd Ave., Minneapolis 6, Minn., Public Health Engineer, State Dept. of Public Health
- Graham Walton, Ph.D., Dept. of Justice, Bureau of Prisons, Washington 25, D. C., Sanitary Engineer, U. S. Public Health Service

#### *Industrial Hygiene Section*

- Lt. C. Fred Berghout, Sn.C., Army Industrial Hygiene Laboratory, Bldg. 330, Edgewood Arsenal, Md., Industrial Hygiene Engineer
- E. H. Carleton, M.D., Inland Steel Co., East Chicago, Ind., Medical Director
- Thomas R. Donoghue, 2401 Grant Bldg., Pittsburgh, Pa., Director of Safety, Pittsburgh Plate Glass Co.
- Augustus Gibson, M.D., East Main St., Mendham, N. J., Industrial Medicine, Merck & Co., Inc.
- Alan H. Sorrell, M.D., 138 W. 11th St., New York, N. Y., Student, School of Public Health, Columbia University
- Stewart L. Stokes, 51 Franklin, Concord, N. H., Senior Industrial Hygiene Engineer, State Dept. of Health
- Raphael L. Tiruchelvam, D.P.H., D.T.M., Harvard School of Public Health, Boston,

Mass., Student Medical Officer of Health,  
Dept. of Labor, Ceylon  
Richard C. Whiting, M.D., 700 Main St.,  
Hartford, Conn., Asst. Surgical Director,  
Travelers Insurance Co.

#### *Food and Nutrition Section*

Reginald M. Archibald, M.D., Ph.D., 615 N.  
Wolfe St., Baltimore 5, Md., Professor of  
Biochemistry, School of Hygiene and Pub-  
lic Health, Johns Hopkins University  
S. L. Brevit, 1763 21st Ave., San Francisco 22,  
Calif., Asst. District Supervisor, City Dept.  
of Public Health  
John H. Browe, M.D., University of Vermont,  
College of Medicine, Burlington, Vt., Re-  
search Assoc. in Medicine  
Miriam Brush, Ph.D., 322 N. Franklin Ave.,  
Ames, Iowa, Research Assoc. in Foods and  
Nutrition, Iowa State College  
C. Kenneth Crocker, M.S., 1241 N. Sedgwick,  
Laboratory, Chicago, Ill., Bacteriologist,  
Oscar Mayer and Co.  
Thomas F. Cunningham, 2431 34th Ave., San  
Francisco, Calif., Inspector, City Dept. of  
Public Health  
Zelma P. Faulkner, M.S., State Health Dept.,  
Jackson, Tenn., Nutritionist, Regional Office  
Alice E. Heimbach, 1276 Norfolk, Willow  
Run, Mich., Student, School of Public  
Health, University of Michigan

#### *Maternal and Child Health Section*

Katherine Kuder, M.D., 320 E. 42nd St., New  
York 17, N. Y.  
Curtis L. Mendelson, M.D., 205 E. 69th St.,  
New York 21, N. Y., Obstetrical Consultant,  
City Health Dept.  
Jack Sabloff, M.D., 200 Maple St., Man-  
chester, Conn., Crippled Childrens Physician,  
State Dept. of Health  
Maynard C. Shiffer, M.D., 1022 S.W. 11th  
Ave., Portland 5, Ore., Director, Maternal  
and Child Health Section, State Board of  
Health

#### *Public Health Education Section*

Kenneth R. Bailey, National Foundation for  
Infantile Paralysis, La Salle, Ill., Field  
Representative  
Teodorico C. Bensang, P. O. Box 568, Ann  
Arbor, Mich., Student, School of Public  
Health, University of Michigan  
Robert A. Bowman, M.S., 511 Church St.,  
Ann Arbor, Mich., Student, School of Pub-  
lic Health, University of Michigan  
Barbara Brooks, M.A., West Lodge Dorm 2,  
Ypsilanti, Mich., Student, School of Public  
Health, University of Michigan  
Caleb L. Campbell, 1016 Baltimore, Kansas

City 6, Mo., State Representative, National  
Foundation for Infantile Paralysis  
Grace H. Daniel, M.S.P.H., 816 N. Main,  
Salisbury, N. C., Health Educator, Rowan  
County Health Dept.  
Graydon Dorsch, 23 La Arcada Court, Santa  
Barbara, Calif., Exec. Secy., Santa Barbara  
County Tuberculosis and Health Assn.  
Mark H. Harrington, J.D., Equitable Bldg.,  
Denver, Colo., Attorney  
Louise M. Herbolsheimer, R.N., Box 517, c/o  
Mrs. G. A. Harrer, Chapel Hill, N. C., Stu-  
dent, University of North Carolina, School  
of Public Health  
Luz D. Hernandez, M.S.P.H., Box 362,  
Guayama, P. R., Health Educator, Insular  
Dept. of Health  
Dorothy E. Howard, R.N., West Lodge No. 2,  
Ypsilanti, Mich., Student, School of Public  
Health, University of Michigan  
Frank H. Jenne, 1013 E. Harwick Court,  
Willow Village, Ypsilanti, Mich., Student,  
School of Public Health, University of  
Michigan  
Lillian A. Johnson, R.N., 330 E. 31st St.,  
Apt. 2B, New York 16, N. Y., Staff Nurse,  
Community Service Society  
Esther H. Kottke, Ph.D., M.P.H., 103 Johnson  
St., Chapel Hill, N. C., Student, School of  
Public Health, University of North Carolina  
Orlo W. Miller, M.S., 1598 Tully Court, Wil-  
low Run, Mich., Graduate Student, School  
of Public Health, University of Michigan  
Reubena H. Nolan, P. O. Box 489, Mobile 3,  
Ala., Senior Clerk, Division of Communi-  
cable Disease Control, Mobile County  
Board of Health  
Jean E. Pierce, 280 Bloor St. West, Toronto  
5, Ontario, Can., Exec. Secy., Canadian  
Cancer Society  
Mary Elizabeth Pillsbury, M.A., R.N., 4035  
West Central, Albuquerque, N. M., Advisor  
and Writer, Communicable Disease Technics  
and Public Health Education  
Beatrice A. Pyle, M.S., Kendrick House,  
Vassar College, Poughkeepsie, N. Y., In-  
structor in Physical Education  
Dr. Ponniah Rajasingham, 55 Shattuck St.,  
Boston 15, Mass., Medical Officer of Health,  
Ceylon, Dept. of Medical and Sanitary  
Services  
Mary E. Riser, M.S.P.H., Greenville County  
Health Dept., Greenville, S. C., Health  
Educator  
Janet M. Ruggles, 547 40th St., Oakland 9,  
Calif., Student, University of California  
John F. Schaefer, M.D., Hillside Hospital,  
P. O. Box 38, Bellerose 6, N. Y., Adminis-  
trator



Dorothy F. Schober, M.P.H., 161 Church St., Health Dept., New Haven, Conn., Health Education Consultant, Council of Social Agencies

Charlotte P. Smith, R.N., 405 W. Ninth Ave., Columbus 1, Ohio, Health Educator, Divisions of Venereal Diseases and Tuberculosis, State Dept. of Health

Warren E. Smith, 5 Harvard Place, Ann Arbor, Mich., Student, School of Public Health, University of Michigan

William Styring, Jr., 2545 South Pennsylvania St., Indianapolis 2, Ind., State Field Representative, National Foundation for Infantile Paralysis Inc.

Sue Swain, P. O. Box 1297, Louisville, Ky., Secy. of Health Education, Louisville Tuberculosis Assn.

Fred E. Wankan, Jr., 3015 Tennyson St., N.W., Washington, D. C., State Representative, National Foundation for Infantile Paralysis, Inc.

Norman E. Weaver, 414 Kent St., Wausau, Wis., State Representative, National Foundation for Infantile Paralysis, Inc.

#### *Public Health Nursing Section*

Olive L. Barbin, R.N., 957 Russell St., Augusta, Ga., Director of Nurses, Richmond County Health Dept.

Gertrude A. Barnes, 333 Southern Blvd., New York 54, N. Y., Public Health Coordinator, Lincoln Hospital and School for Nurses

Ruth Clemetson, Public Health Nurse, Palmer, Alaska, Territorial Dept. of Health

Evelyn R. Dill, R.N., Box 661, Denville, N. J., Public Health Nurse, Division of Venereal Disease Control, State Health Dept.

Hazel B. Furman, R.N., 1812 E. 55th St., Seattle 5, Wash., General Advisory Nurse, State Dept. of Health

Frances Guthrie, R.N., Rt. 1, Box 288, Santa Cruz, Calif., Public Health Nurse, Santa Cruz Dept. of Public Health

Durice D. Hanson, R.N., 131 Forrest Ave., N.E., Apt. 23, Atlanta 3, Ga., Exec. Secy., State Nurses Assn.

Patricia I. Heeley, R.N., 1569 E. 22nd St., Brooklyn 29, N. Y., District Supervising Nurse, City Dept. of Health

Ann E. Hill, 700 El Camino Del Mar, San Francisco, Calif., Instructor, Public Health Nursing, University of Calif.

Dorothy H. Jeffreys, R.N., Rt. 3, Box 763, Watsonville, Calif., Staff Nurse, Santa Cruz County Health Dept.

Sara B. Katz, R.N., 301 East 21st St., Apt. 3J, New York 10, N. Y., Student, New York University

Herma Klemeyer, 1109 S. San Joaquin,

Stockton, Calif., Public Health Nurse, San Joaquin Local Health District

Frances M. Mack, 1100 Lawrence, Topeka, Kans., Staff Nurse, Topeka-Shawnee County Health Dept.

Hannah B. Mann, 320 W. Gay St., West Chester, Pa., Visiting Nurse, West Chester Visiting Nurse Assn.

Marion R. Nighman, 1484 Lenox Court, Willow Run, Mich., Student, School of Public Health, University of Michigan

Magnhild O. Bogue, Box 528, Juneau, Alaska, Asst. Nursing Supervisor, Territorial Dept. of Health

Elizabeth O. Prescott, 108 E. 96th St., New York 28, N. Y., Student, New York University

Lucille J. Ruedinger, R.N., 187 Algoma Blvd., Oshkosh, Wis., Nurse Director, Oshkosh Visiting Nurse Assn.

Mary H. Scholl, R.N., State Division of Health, Jefferson City, Mo., Advisory Public Health Nurse

Mary G. Shea, R.N., 149 Walnut St., Holyoke, Mass., Supervisor, Visiting Nurse Service

Wilhelmina L. Whisner, M.A., R.N., 619 First St., Moultrie, Ga., Supervisor of Public Health Nursing, Colquitt-Brooks County Health Unit

Juliet A. Whitteker, R.N., Brewster, Cape Cod, Mass., Public Health Nursing Supervisor, Barnstable County Health Dept.

Bertie R. Willits, R.N., Ben Lomond, Calif., Staff Nurse, Santa Cruz County Dept. of Public Health

#### *Epidemiology Section*

Juan J. Alcocer-Campero, M.D., M.P.H., Calle Morelia 21, Hermosillo, Sonora, Mex., Director of Sonora State Public Health and Welfare

Norman D. Begg, M.D., Eastern Hospital, Homerton Grove, London E.9, Eng., Epidemiologist, UNRRA Mission to Poland

Lt. Comdr. Robert E. Coker, Jr., M.C., 615 N. Wilfe St., Baltimore 5, Md., Student, Johns Hopkins School of Hygiene and Public Health

Lucio Costa, M.D., Rua Barao Bom Retiro, 856, Rio de Janeiro, Brazil, S. A., District Officer, National Malaria Service

Jose C. de Melo Falcao-Neto, M.D., Rua Jaragua 62, Benfica, Rio de Janeiro, Brazil, S. A., Officer of the Army Biology Institute

Celso Arcoverde de Freitas, M.D., Sete Setembro 127, Recife, Brazil, S. A., District Officer, National Plague Service, Dept. of Health

Francis F. Harrison, M.D., Bassett Hospital, Cooperstown, N. Y., Assoc. in Pathology

John W. Hart, 29-55 Bell Blvd., Bayside, N. Y., Vice-President and Director of Clinical Investigation, Winthrop Products, Inc.  
 George G. Hatfield, M.D., C.M., N.B. Dept. of Health, Fredericton, New Brunswick, Can., Director, Division of Venereal Disease Control, New Brunswick Dept. of Health  
 A. C. Hollister, M.D., 760 Market St., San Francisco, Calif., Medical Officer, Epidemiologist, State Dept. of Public Health  
 Hilbert Mark, M.D., M.P.H., 1900 Thomas Ave., N., Minneapolis 11, Minn., Tuberculosis Control Officer, State Dept. of Health  
 William L. Morrison, P. O. Box 321, Santa Cruz, Calif., Chief Sanitarian, Santa Cruz County Dept. of Public Health  
 Theodore T. Puck, Ph.D., Dept. of Medicine, University of Chicago, Chicago 37, Ill., Asst. Professor of Biochemistry  
 Eduardo Saracho-Lopez, M.D., Servicio Cooperativo Interamericano de Salud Publica, Bolivia, Cochabamba, S. A., Chief, Malaria Control  
 Ralph R. Sullivan, M.D., 4116 Aldrich Ave., S., Minneapolis, Minn., Acting Director, Bureau of Health Maintenance, Dept. of Health  
 Oscar Sussman, D.V.M., Grassy Hill Rd., Orange, Conn., Student, Yale University

#### *School Health Section*

Ruth Abernathy, Ph.D., University of Texas, Austin, Tex., Assoc. Professor, Physical and Health Education  
 Olive M. Lind, R.N., 612 Washington, Dundee, Ill., School Nurse, Zion City Schools  
 Tah-Mou P'eng, M.D., Dr.P.H., Directorate of Army Medical Service, Nanking, China. Director, Division of Preventive Medicine  
 Eva E. Peyton, R.N., 1638 Mikahala Way, Honolulu, Hawaii, Asst. Director, Division of Health Education, Dept. of Public Instruction  
 Ida M. Stein, M.D., Office of Indian Affairs, Sitka, Alaska, School Physician, Medical Officer

#### *Dental Health Section*

Floyde E. Hogeboom, D.D.S., 3780 Wilshire Blvd., Los Angeles 5, Calif., Dentist  
 Leo H. Kal, 1800 W. Fillmore St., Chicago 12, Ill., X-Ray Technician (Dental), State Dept. of Public Health  
 Robert M. Stephan, D.D.S., National Institute of Health, Bethesda, Md., Dental Surgeon (R), U. S. Public Health Service  
 A. B. Sutherland, D.D.S., 426 St. Clair Ave. East, Toronto, Ont., Can., Dental Consultant, UNRRA Polish Mission, Warsaw

#### *Unaffiliated*

Anne R. Eisenstadt, 359 E. 8th St., New York 9, N. Y., Accountant, Division Chief, Emergency Maternity and Infant Care Program, City Health Dept.  
 Stanton Garfield, M.D., M.P.H., 5 Monument St., Concord, Mass.  
 Sidney S. Lee, 84 Howe St., Apt. 510, New Haven 11, Conn., Student, Yale University, School of Medicine  
 Louis Liswood, M.B.A., 3800 E. Colfax Ave., Denver 6, Colo., Superintendent, National Jewish Hospital  
 R. Meintjes, P. O. Box 58, Luanshya, Northern Rhodesia, Health Officer, Management Board of Luanshya  
 Woodrow P. Pantoja, M.D., 309 E. Catherine St., Ann Arbor, Mich., Laboratory Asst., Servicio Especial de Saude Publica  
 Vittorio Puddu, M.D., via Savoia 86, Rome, Italy, Director, Italian Center for Rheumatic Fever  
 Mervin G. Rhoades, D.V.M., 801 S. Gramercy Drive, Los Angeles 5, Calif., Student, Harvard University, School of Public Health  
 Francis A. Robinson, LL.B., 1701 East Grand Blvd., Detroit 11, Mich., Representative, National Foundation for Infantile Paralysis, Inc.  
 Harry Sackren, M.D., 3 Hancock St., Brooklyn, N. Y., Student, School of Public Health, Columbia University  
 John C. Snyder, M.D., 695 Huntington Ave., Boston 15, Mass., Professor of Public Health Bacteriology, Harvard University, School of Public Health  
 Antonio Vaz Cavalcanti, M.D., 309 E. Catherine, Ann Arbor, Mich., Student, School of Public Health, University of Michigan

#### BACK ISSUES OF AMERICAN JOURNAL OF PUBLIC HEALTH NEEDED

In order to be able to furnish complete volumes of the JOURNAL for recent years the Association has need of the following issues and will appreciate it if members who can spare any or all of these numbers will mail them to the Association office, 1790 Broadway, New York 19, N. Y., collect.

1941—January February, April, July, August  
 1942—January, March, August  
 1943—January, August  
 1945—August  
 1946—September, October, November

## EMPLOYMENT SERVICE

The following pages present information for those seeking qualified public health personnel and for those seeking positions in public health.

This is a service of the Association conducted without expense to the employer or employee.

Address all correspondence to the Employment Service, A.P.H.A., 1790 Broadway, New York 19, N. Y., unless otherwise specified.

### POSITIONS AVAILABLE

(Supplemental to list in February Journal)

**Wanted:** Director of city health department laboratory and associate professor of bacteriology at university, combined position, Midwest. Beginning combined salary \$4,000 with yearly increases. Tenure protected by Civil Service, retirement provisions. Write Box F, Employment Service, A.P.H.A.

**Wanted:** Veterinarian in new position, state health department in East. Write Box Y, Employment Service, A.P.H.A.

**Wanted:** County Nutritionist for the Department of Health, Territory of Hawaii. Must have a bachelor's degree in Home Economics with a major in Foods. Some experience in teaching or food clinics is desirable. The position requires talks and demonstrations to clinics and health conferences, other group teaching, individual consultation and family counseling in food and nutrition problems. Ability to prepare visual aid materials is desirable. Starting salary is \$212.92 with a \$25 cost of living adjustment. Write Mrs. Marjorie Abel, Division of Nutrition, Territorial Health Department, Honolulu, T. H.

**Wanted:** Sanitary Engineer with training and experience in public health. County 100 miles from Chicago, 35,000 population. Salary \$315; travel allowance \$50.00 per month. Write Lee Co. Health Department, Dixon, Illinois.

**Wanted:** Bacteriologist-immunologist, Ph.D. for research and developmental work in one of the important companies in pharmaceutical industry. Eastern location. Salary according to experience. Write Box O-2, Employment Service, A.P.H.A.

**Wanted:** Public Health Nurse as Assistant Director in children's Health School. Full responsibility for home investigation and admission of children. Also coöperative responsibility with the Director for administration of the institution. Good opportunity for person interested in health teaching. Salary \$2,000-\$2,400 plus full maintenance. Write

Health Hill, 2801 East Boulevard, Cleveland, Ohio.

**Wanted:** Public Health Nurses in official generalized program of Washtenaw County, Michigan, at Ann Arbor. Cultural and recreational advantages of University town. Agency is field teaching center for University of Michigan. Opportunity to study at University. Write for details to Nursing Director, 720 E. Catherine Street, Ann Arbor, Mich.

**Wanted:** Public Health Nurses for staff positions in a progressive automobile city in Michigan. Population 150,000. Beginning salary \$210. Annual increases. Merit and retirement systems. Program includes generalized field service, school nursing, interviewing in clinics and group work. Minimum requirement certificate in Public Health Nursing. Write Director, Public Health Nursing, Department of Health, Box 28, Flint, Mich.

**Wanted:** Public Health Nurses. Generalized service, supervision, staff of 8. Public health nursing course, experience desired. Salary \$2,100-\$2,700 depending on professional background and experience, car allowance \$60 per month. Health department in commuting distance from Chicago, Ill. Apply: Dr. James W. Chapman, Director, DuPage County Health Department, 52 E. St. Charles Road, Villa Park, Illinois.

**Wanted:** District Public Health Officers for Washington State Department of Health. Required: M.D., internship, 3 years' experience in professional medical work (or M.P.H. and one year's medical experience). Beginning salary: \$6,000. Maximum beginning salary: \$7,140 (for those with additional experience in public health work). Write Robert G. Beaumier, Administrative Officer, Division of Central Administration, Washington Dept. of Health, Smith Tower, Seattle 4, Wash.

**Wanted:** Assistant District Public Health Officers. Required: M.D., internship, one year's experience in profes-

sional medical work. Beginning salary: \$5,520. Beginning salary. \$5,760 (for those with M.D. and M.P.H. degrees and internship). Write Robert G. Beaumier, Administrative Officer, Division of Central Administration, Washington Dept. of Health, Smith Tower, Seattle 4, Wash.

**Wanted: Industrial Engineer.** \$3,840 to begin. Minimum 3 years' experience in Industrial Hygiene Engineering. College graduate with major in Engineering, preferably supplemented with graduate work in Industrial Engineering. Permanent. Write Mr. A. T. Johnson, Personnel Officer, Oregon State Board of Health, 1022 S.W. 11th Avenue, Portland 5, Ore. Phone ATwater 9233.

**Wanted: Experienced public health nurse** capable of supervising several nurses in three counties and formulating efficient programs for school, MCH, TB (generalized program). Starting salary \$225 per month plus 7½¢ per mile for travel. Write Robert F. Sayre, M.D., Director, Columbia County Health Department, Lake City, Fla.

**Wanted: Sanitary officer, or sanitarian,** experienced in public health work capable of formulating and directing a sanitary program for a three-county district. Starting salary \$210 per month plus 7½¢ per mile for travel. Write Robert F. Sayre, M.D., Director, Columbia County Health Department, Lake City, Fla.

**Wanted: Nutrition Supervisor.** Position covered by state merit system. Qualifications: Training: One year graduate study in nutrition and related subjects. Experience: Four years' experience as a nutritionist; or two years' experience as a nutritionist plus four years' experience as an extension specialist in food and nutrition, or as a dietitian in a position involving adult education; or an equivalent combination of experience and training. Salary: \$3,600-\$4,320 plus travel allowance for field expenses; car furnished or 6¢ per mile. Write Director, Bureau of Maternal and Child Health, Michigan Department of Health, Lansing 4, Mich.

**Wanted: Commissioner of Public Health** to serve county of 20,000 persons. Adequate salary. Must have New York State Grade A requirements. Write Dr. Ward L. Oliver, c/o Schoharie County Board of Health, Cobleskill, N. Y.

**Wanted: Public Health Nurse;** salary \$2,001 which includes a cost of living bonus. Apply Columbia County Dept. of Health, 612 Warren Street, Hudson, N. Y.

**Wanted: Dental Hygienist;** salary

\$2,070 which includes a cost of living bonus. Apply Columbia County Dept. of Health, 612 Warren Street, Hudson, N. Y.

**Wanted: Head of Maternal and Child Hygiene and Crippled Children's Section** of the Division of Preventive Medical Services; western state health department. Requirements: M.D. (approved school), approved 1 year internship, M.P.H., 1 year of graduate training and experience in pediatrics and/or obstetrics and 2 years' maternal and child health or crippled children's work in public health agency. One year of public health experience may be substituted by one additional year of graduate training. Beginning salary \$6,000, maximum salary, \$7,140. Write Box C-1, Employment Service, A.P.H.A.

**Wanted: Laboratory Technician** with clinical laboratory experience, with or without completed formal academic training, for routine duties (hematology, chemistry, serology) and assistance in research. Large teaching hospital. Midwest. Write Box G-1, Employment Service, A.P.H.A.

**Wanted: Supervisor for demonstration area,** in Richmond, Va., to head up amalgamated nursing services of school, health department and I.V.N.A. Must have degree with major in public health nursing including preparation in supervision, administration and personnel guidance; experience in an official generalized program which included school nursing and/or experience in a generalized program in a nonofficial agency which included school nursing. Apply to M. Viola Hahn, Chairman, Inter-agency Public Health Nursing Committee, 223 South Cherry Street, Richmond, Va.

**Wanted: M.D. with public health training** and experience for new Bi-County Health Department, Southeastern Illinois. Combined population—approximately 35,000. Minimum budget provides for \$1 per capita. Health Department offices in both counties. Salary \$7,200 plus \$75 monthly for travel. Write to Roland R. Cross, M.D., Director, Illinois Dept. of Public Health, Springfield, Ill.

**Wanted: Health Officer** for county health department in central Illinois. Department established on temporary basis during the war, has now been made permanent. Staff of eleven. Budget approximately \$50,000, population 45,000. Active community support. Salary \$7,200 plus travel allowance. Write to Roland R. Cross, M.D., Director, Illinois Dept. of Public Health, Springfield, Ill.

**Wanted: Director of Public Health**

**Nursing Association**, with qualifications to meet minimum N.O.P.H.N. standards for director. Salary open. Write Acting Director, Public Health Nursing Association, City Hall, Des Moines, Ia.

**Wanted:** Field Nursing Supervisor with B.S. in public health nursing, generalized experience and must have had university course in supervision. Prefer nurse experienced as student field teacher. Salary range \$190-\$220. Write Acting Director, Public Health Nursing Association, City Hall, Des Moines, Ia.

**Wanted:** Public Health Nurses for generalized nursing program. P.H.N. certificate required or its equivalent in advanced study. Salary \$157-\$209; 42 hour week. Retirement plan. One month vacation with pay. Write Acting Director, Public Health Nursing Association, City Hall, Des Moines, Ia.

**Wanted:** Bacteriologist, young man, in industrial consulting laboratory in large midwestern city. Preferred training: bacteriology major, chemistry minor. Experience in industrial or sanitation work desirable but not necessary. Duties include laboratory analyses, some field work. Promotional analyses, some field work. Promotional opportunities. Salary \$150 or more, depending entirely on qualifications. Write Box D-1, Employment Service, A.P.H.A.

**Wanted:** Veterinarian qualified to do meat inspection work. Salary \$3,000 to start. Write L. C. Neer, D.V.M., Acting Health Commissioner, Health Department, City Hall, Middletown, Ohio.

**Wanted:** Two supervisors for public health nurses in a city-county health department, generalized nursing program. Civil Service. Salary \$2,400-\$2,820, plus mileage. Maximum salary reached in

three year period. Must have had adequate experience in field work supervision and a degree in Public Health Nursing preferred. Write Dr. George A. Denison, Box 2591, Birmingham, Ala.

**Wanted:** Public Health Nurses for generalized nursing program. Salary range \$225-\$255 per month. Under Civil Service, 40 hour week, vacation and sick leave privileges. Write Director of Public Health Nursing, City of Seattle, 504 County-City Building, Seattle 4, Wash.

**Wanted:** Two well-qualified staff public health nurses in Clatsop County. Salary \$225 per month plus travel. Write Miss Aileen Dyer, Director, Public Health Nursing Section, 1022 S.W. 11th Avenue, Portland, Ore.

**Wanted:** Staff Nurses for 250 bed tuberculosis hospital; 40 hour week. Salary \$210 per month; \$30 deducted if maintenance is desired. Opportunity for postgraduate work with university credit. Apply Director of Nursing Service, Firland Sanatorium, Richmond Highlands, Wash.

**Wanted:** School Dentist, white. Salary range \$3,600-\$4,500, starting salary depending on experience. Write Health Officer, Health Center, Alexandria, Va.

**Wanted:** X-Ray Technician, white. Salary range \$2,000-\$2,400, starting salary depending on experience. Write Health Officer, Health Center, Alexandria, Va.

**Wanted:** Graduate Sanitary Engineer to head division and supervise two sanitarians. Permanent position. Must be trained in water and sewage treatment plant sanitation. Beginning salary \$3,120. Write Will County Health Department, 21 E. Van Buren Street, Joliet, Ill.

#### POSITIONS WANTED

**Nutritionist** with some hospital dietetic experience and experience in food research and university lecturing for 3 years, desires position as nutritionist in public health department, social agency or health unit in the U. S. Canadian citizen. Write Box N-415, Employment Service, A.P.H.A.

**Physician**, former Health Unit Director, considerable administrative experience, industrial experience during the war. Seeks part-time position in health work on administrative or clinical basis or as preemployment, school or insurance examiner. New Orleans area. Write Box A-518, Employment Service, A.P.H.A.

**Health Educator**, Negro, with Bachelor's and master's degrees in Public Health. Now professor of Health Education in Class A college. Desires position with state or local health organization or other agency in the East or Middle West. Write Box H-528, Employment Service, A.P.H.A.

**Engineer**, 31 years old, B.S. (C.E.), M.S. (Sanitary Engineering), nine years' experience in public health engineering with state health department, research and teaching in school of public health and school of engineering, desires position on the teaching staff of school of public health or school of engineering, or as

public health engineer in state or local health department. Write Box E-505, Employment Service, A.P.H.A.

Negro dental student will graduate in June, holds both B.S. and M.S.P.H. degrees. Seven years of educational and administrative experience. Veteran of World War II. Desires a full-time job with either a State, County, or City Health Department in Dental Education or as a School Dentist. Thirty-four years old. Write Box D-20, Employment Service, A.P.H.A.

Health Educator, trained and experienced in the use of the various media—radio, speakers' bureau, publications, publicity, exhibits. Record of successful work in community organization, and in planning and directing mass x-ray programs. Write Box H-530, Employment Service, A.P.H.A.

Biologist, three (3) years' experience as insect and rodent control officer at large permanent Army post; six (6) years' teaching experience, B.S. and M.S. degrees in biology and zoölogy; recent

Capt., Sanitary Corps A.U.S.; present salary \$4,100 per year; seeks position as pest control engineer or biology instructor. Write Box E-500, Employment Service, A.P.H.A.

Bacteriologist, M.S., minor chemistry, 8 years of experience in industrial, sanitary, and clinical bacteriology desires responsible position in public health, clinical or industrial laboratory or teaching institution. Write Box L-505, Employment Service, A.P.H.A.

Nutritionist, M.S. (nutrition). Experience: State health Department 6½ years, federal agency 1½ years, hospital dietitian 5 years. Write Box N-400, Employment Service, A.P.H.A.

Ph.D., male. Twelve years' experience in teaching and independent research in parasitology, immunology, and bacteriology at university medical schools and research laboratories, desires responsible position in teaching or research institution, governmental agency or industry. Write Box M-473, Employment Service, A.P.H.A.

### U. S. Public Health Service Announces Examinations for Nurses

Examinations for the appointment of registered nurses to the U. S. Public Health Service will be given during March and April, 1947, in cities throughout the nation, according to an announcement made by Miss Lucile Petry, Chief of the Division of Nursing.

"The Public Health Service offers opportunities for recent graduates as well as experienced nurses," Miss Petry said.

"For the new registered nurse who can qualify here is an opportunity to acquire good initial experience. The Public Health Service offers the experienced nurse a permanent career with the advantages of professionally stimulating work, job security, regular salary increases, and opportunities for advanced study and promotion on the basis of training and ability."

Nurses interested in obtaining further details concerning appointment to the U. S. Public Health Service should write to Miss Lucile Petry, Chief, Division of Nursing, U. S. Public Health Service, Washington 25, D. C. Specific dates for examinations will be announced shortly.

### Examinations for Scientists for Appointment to the Regular Corps of the U. S. Public Health Service

Seventy-five vacancies exist in grades of Assistant and Senior Assistant Scientist in

the Regular Corps of the U. S. Public Health Service. Written examinations will be held April 14 and 15, oral examinations during the period February 13 to April 9 in thirty cities strategically located throughout the United States.

Commissions are available to scientists trained in any of the following fields: bacteriology, mycology, parasitology, entomology, malacology, biology, chemistry, physiology, physics, statistics (mathematical, demographic, etc.), psychology, and for milk and food specialists.

Requirements: (1) Assistant Scientist: United States citizenship, 7 years of educational and professional training or experience, certificate or diploma from institution of recognized standing and satisfactory health, as established by physical examination. (2) Senior Assistant Scientist: As for Assistant Scientist, plus four years of additional training or experience.

Remuneration: (1) Assistant Scientist: Annual pay with allowances for dependents, \$3,811. (2) Senior Assistant Scientist: Annual pay with allowances for dependents, \$4,351. For both grades full medical care, hospitalization for appointees and families, including disability retirement, thirty days' annual leave. Periodic promotions. Retirement age: 64.

Application forms and additional information may be obtained from the Surgeon General, U. S. Public Health Service, Washington 25, D. C.

### Fellowships for the Training of Health Educators

The U. S. Public Health Service announces that fellowships leading to a Master's degree in Public Health in the field of health education are again being offered. Candidates must be U. S. citizens between 22 and 40 years of age, must hold a bachelor's degree from a recognized college or university, and must be able to meet the entrance requirements of the accredited school of public health of their choice.

In addition to the degree, courses in the biological sciences, sociology and education may be required. Training in public speaking, journalism, psychology, and work in public health or a related field are considered desirable qualifications.

Tuition, travel expenses for field training and a monthly stipend of \$100 will be provided out of funds furnished by the National Foundation for Infantile Paralysis. The year's training which begins with the 1947 fall term, consists of 8 or 9 months of academic work and 3 months of supervised field experience.

Veterans are encouraged to apply and will be paid the difference between the allowance under the G.I. Bill of Rights and the monthly stipend of \$100. Employees of local and state health departments are not eligible since Federal grants-in-aid are already available for such training purposes.

Application blanks may be obtained by writing the Surgeon General, United States Public Health Service, Washington 25, D. C., and must be filed prior to March 15, 1947.

### Exchange of Public Health Personnel between Hawaii and the Mainland

An opportunity for public health nurses, sanitary and medical officers to work in the Hawaii Health Department is now offered under the new exchange personnel program inaugurated by the Board of Health in the Territory.

As passed by the Hawaii legislature, the enabling act calls for an exchange of personnel for a period not to exceed a year.

Provisions in the act state that each person exchanged by the health department of any state must possess qualifications equal to the qualifications of the person exchanged for him from Hawaii and must hold in the state health department a position which is equivalent to the position held by the person exchanged for him in Hawaii.

Salaries for both exchanging parties

will be paid by the home employer. Travel, board, lodging or other such expenses will not be paid by the Territorial Health Department.

Eligible persons employed on the mainland who desire to take advantage of this exchange program are requested to write Dr. Richard K. C. Lee, Assistant Health Executive of the Board of Health, Territory of Hawaii.

### Fellowships for Physicians and Engineers

The Surgeon General announces that applications for Fellowships in post-graduate public health training for physicians and engineers, for the school year beginning in the fall of 1947, will be received prior to May 1, 1947. The Fellowships are made possible through a grant given by the National Foundation for Infantile Paralysis.

The Fellowships include nine months of training in an accredited school of public health or an acceptable school of sanitary engineering followed by three months of field training.

Requirements: Under 45 years of age, United States citizenship. Physicians must have completed at least one year's internship. Engineers must have a bachelor's or higher degree in sanitary, civil, or chemical engineering, or another engineering degree with experience in public health or sanitary engineering.

The Fellowships are intended for newcomers to the public health field and are not open to employees of state or local health departments for whom federal grant-in-aid funds are already available to the states. The purpose of the Fellowships is to aid in the recruitment of medical and engineering personnel to help fill hundreds of vacancies existing in state and local health departments throughout the country.

The Fellowships are administered by the Surgeon General's Committee on Training of Public Health Personnel. Applicants may secure further details by writing to The Surgeon General, U. S. Public Health Service, 19th and Constitution Ave., N.W., Washington 25, D. C.

### The U. S. Public Health Service Announces Examinations for Medical Officers

The Surgeon General announces competitive examinations for the grades of Assistant Surgeon and Senior Assistant Surgeon. Applicants must be over 21 years of age, U. S. citizens, graduates of recognized medical school and must be able to pass an oral and written as well as a physical examination.

Written examinations will be held on

March 27 and 28 at places convenient to the candidate and the Service; oral examinations before that date in various locations.

Application forms may be obtained by writing to the Surgeon General, U. S. Public Health Service, Washington 25, D. C.

### New York State Holds Examinations for Public Health Nurses

A state-wide open-competitive examination for Public Health Nurse will be held sometime in April, 1947, to fill vacancies in various counties.

There are at present 148 positions available in 33 counties. Entrance salaries range up to \$2,400.

Candidates must be graduates of an approved school of professional nursing. In

addition, they must have completed an approved one year program of instruction in public health nursing, or they must have a combination of public health nursing experience and special training which in the opinion of the Public Health Council is equivalent to the year's course.

Applications must be filed with the State Department of Civil Service, Albany, N. Y., not later than March 21, 1947.

Persons who are interested in this examination for Public Health Nurse and who believe they might meet the minimum qualifications are urged to write immediately to the State Department of Civil Service, requesting application forms and a detailed announcement. A return self-addressed envelope bearing 6¢ postage should be enclosed with this request.

## Advertisement

### Opportunities Wanted

Bacteriologist; B.S., M.S. degrees; 14 years' experience in medical bacteriology, most of which has been in public health laboratories; past three years, chief bacteriologist, laboratories of state department of health; for further information, please write Burneice Larson, Director, The Medical Bureau, Palmolive Building, Chicago 11.

Chemical engineer; Master's in Sanitary Engineering; three years, chief chemist with large industrial company; four years, industrial hygienist, public health department; for further details, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Dentist who has been successful in private practice for 12 years is available; for five years served as member of state board of dental examiners; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Health educator; Bachelor of Education Degree; graduate courses in sanitation; eight years, supervisor of physical education in public schools; three years, sanitarian; past three years health educator,

municipal department of health; for further information, please write Burneice Larson, Director, The Medical Bureau, Palmolive Building, Chicago 11

Nutritionist; B.S. and Master's degree, Middle western university; several years' successful experience in hospital dietetics; four years' nutritionist with state department of health; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Well trained public health physician is available for an appointment of administrative character; A.B., M.D., M.P.H. degrees, leading schools; several years, epidemiologist, state department of health; past four years, important administrative appointment with large teaching institution; for further information, please write Burneice Larson, Director, The Medical Bureau, Palmolive Building, Chicago 11.

Public health nurse is available for administrative position in public health; Bachelor of Science in Education with major in Public Health nursing; past several years, supervisor public health staff, important war project; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.



## NEWS FROM THE FIELD

### SANITARY RATINGS OF INTERSTATE MILK SHIPPERS

Milk shortage is a periodic condition concerning many cities. To correct this condition new producing areas are called upon frequently to augment the supply of milk coming from the usual producers. However, many health officers will not approve new sources of supply until they have been inspected and certified as meeting the standards set by the communities desiring to use these sources.

The U. S. Public Health Service is attempting to meet these difficulties by publishing quarterly a list of interstate milk shippers and supplies available for interstate shipment. The first list will appear on March 1, 1947. This action follows recommendations of the Conference of State and Territorial Health Officers for some solution to the problems mentioned above. Application by shippers for listing as well as acceptance of any listed supply in any city will be optional. To protect the accepting city, each shipper listed must be rated by the state of origin with spot checks of the state's inspection laboratory and rating procedures by the U.S.P.H.S. Ratings will be made and computed in accordance with the Public Health Service rating procedure. The rating figure listed will indicate the weighted percentage compliance with the Grade A Standards of the Milk Ordinance and Code recommended by the Public Health Service. Receiving areas operating under the Public Health Service Milk Ordinance may, in accordance with Section 11, accept as Grade A the outside sources rating 90 per cent or more providing that the bacterial counts and the temperatures of the milk upon receipt are satisfactory.

The above information is based upon a letter dated December 31, 1946, written to "All State Milk Control Authorities" by Thomas Parran, Surgeon General of the Public Health Service.

### FEDERAL EMPLOYEE HEALTH PROGRAM

Public Law 658 passed by the 79th Congress of the United States makes possible the establishment of a preventive medical program for federal employees. A suggested plan for such a program was presented in a recent issue of *Public Health Reports* (61:46 (Nov. 15), 1946, pp. 1642-1654). In accordance with the Act government agencies may establish and operate or contract for the establishment and operation of health service programs. The scope of these programs is limited to

1. Treatment of on-the-job illness and dental conditions requiring emergency attention
2. Preemployment and other examinations
- 3 Referral of employees to private physicians and dentists
4. Preventive programs relating to health

The plan also sets up proposed standards and recommendations in detail for types of programs, personnel equipment, and qualities.

In January the U. S. Public Health Service announced the appointment of John W. Cronin, M.D., as head of the Federal Employee Health Division, created within the Bureau of Medical Services. The Division will develop standards and policies, review, appraise, and conduct studies of federal employee health programs. It will provide consultation services to federal agencies and contract with them to operate employee health programs. Dr. Cronin,

with the Service since 1932, has most recently been Medical Officer in charge of the U. S. Public Health Service Dispensary in Washington, D. C.

#### RESEARCH REQUEST

J. B. Gerberich, Department of Biological Science, Michigan State College, East Lansing, Mich., is interested in obtaining reprints, copies of unpublished manuscripts and results or observations made in connection with the biological control of mosquitoes. He wants to bring this information together in the form of annotated bibliographies.

#### FILMS AND FILM STRIPS ON HEART DISEASE

The Metropolitan Life Insurance Co. announces, as a part of its educational program on heart disease, a sound film strip entitled, "Jimmy Beats Rheumatic Fever" and a 10 minute motion picture, "Be Your Age." The latter was released to theaters in certain states in February and will be continued until each of the 48 states has been covered. This motion picture was prepared with the coöperation of the American Heart Association. Available with it are mimeographed copies of a suggested speech and radio dialogue useful in developing a program. The pamphlet *Your Heart* is also available for education of the general public.

As mentioned earlier in the *Journal* (October, p. 1235), material for professional groups is also available, primarily *Studies in Heart Disease*, a booklet presenting the 16 exhibit charts displayed at the July, 1946, meeting of the American Medical Association.

Requests for this material should be made to Health and Welfare Division, Metropolitan Life Insurance Co., 1 Madison Avenue, New York 10, N. Y.

#### NATIONAL NEGRO HEALTH WEEK

The U. S. Public Health Service announces the 33rd annual observance of

National Negro Health Week March 30–April 6. Its special objective announced for the current year is "Community-Wide Coöperation for Better Health and Sanitation." The announcement gives suggestions for organizing the week's program—broadcasts, sermons, posters, etc.—all designed to initiate the year's community health program. A list of suggested sources of coöperation is included. The health week publications are available for purchase from the Service.

For further information write National Negro Health Week Committee, U. S. Public Health Service, Washington 25, D. C.

#### U. S. CONGRESS CONSIDERS DEPARTMENT OF HEALTH, EDUCATION AND SECURITY

On January 10 Senators Fulbright and Taft introduced into the U. S. Senate a bill to establish the Department of Health, Education and Security, with a Secretary holding a Cabinet position. This would put all health, social security and educational functions of the government under the supervision of the new Cabinet officer. A similar bill has been introduced into the house by Representative Harris of Arkansas.

#### LOW INFANT MORTALITY RATE IN 1945

Final figures for 1945 published by the U. S. Public Health Service indicate the lowest infant mortality rate ever recorded for the United States—38.3, a decrease from the 1944 rate of 39.8. Provisional figures for the first ten months of 1946 indicate a further decrease of 3.2 per cent from the rate for the same period of 1945.

The five states with the lowest rates, all under 30, are in order: Nebraska and Rhode Island tied, Oregon, North Dakota, and Connecticut. The four states with a rate of more than 50 are Colorado, West Virginia, Arizona, and

New Mexico, the last named showing also the highest percentage rise, from 89 to 101.

The report issued by the Service suggests that one of the reasons for the lowered mortality rate is the 3.2 per cent increase in proportion of babies born in hospitals.

#### \$1,877,000,000 FOR SOCIAL WELFARE, HEALTH AND SECURITY REQUESTED

The President's budget message to the Congress of the United States requested 1948 appropriations of \$37,500,000,000. Five per cent of this, \$1,877,000,000, was requested to promote the health, welfare, and social security of the American people, chiefly through the Federal Security Agency. For the promotion of public health, including the hospital construction program, appropriations of \$203,000,000 were requested. Estimated expenditures for public health during the current year are \$170,000,000, and for 1948, \$181,000,000.

#### TWO MORE NATIONS RATIFY WORLD HEALTH CHARTER

The recent ratification of the constitution of the World Health Organization by New Zealand and Syria has been reported by Dr. Brock Chisholm, Executive Secretary of the Interim Health Commission. Six nations including Canada, China, Iran, and the United Kingdom have now ratified the constitution. Twenty-six ratifications are required to bring it into force.

#### WORLD MEDICAL ASSOCIATION

Meeting in London in September, 1946, under the auspices of the British Medical Association and the Association Professionnelle Internationale de Médecine, representatives of 21 European and 10 non-European countries formed an international organization of medical associations. To be known as the World Medical Association, its aims

are: "To promote closer ties among international medical organizations of the doctors of the world in order to assist all peoples to attain the highest possible level of health; to consider the professional problems among the profession; to organize an exchange of information on matters of interest to the profession; and to establish relations with, and to present the views of the medical profession to, the World Health Organization, and the United Nations Educational, Scientific and Cultural Organization."

#### NATIONAL SOCIAL WELFARE ASSEMBLY

The *Journal* has already told its readers about the organization of the National Social Welfare Assembly (July, 1946, p. 694), and its Director's Notes (Oct., 1946, p. 1111). The Assembly now has 46 constituent agencies, among which are: American Association of Medical Social Workers, American Association of Psychiatric Social Workers, American Hearing Society, American Social Hygiene Association, National Organization for Public Health Nursing, National Society for the Prevention of Blindness, National Tuberculosis Association, the Children's Bureau, and the U. S. Public Health Service. The National Health Council is one of its five associate groups. It has recently distributed a pamphlet giving the reason for its existence—to provide the central machinery through which national planning and coordination might be carried on—its antecedents, the services it is currently prepared to render and those it expects to develop. The Assembly's President is now Fred Ramsey; Donald B. Armstrong, M.D., Sallie Bright, Walter Clarke, M.D., Kendall Emerson, M.D., Shelby Harrison, Ruth Houlton, R.N., and Ellen C. Potter, M.D., are on its Executive Committee. Robert E. Bondy is the Director and the national offices are at 1790 Broadway, New York 19.

NATIONAL HEALTH COUNCIL NAMES  
BAILEY B. BURRITT AS EXECUTIVE  
DIRECTOR

The National Health Council, on January 30, through its president, Philip R. Mather, announced the appointment of Bailey B. Burritt, long a leader in the health field, as its executive director. Mr. Burritt will launch a program of more active leadership among the 20 national voluntary health agencies represented on the Council. The basic aims of the new program are more effective prevention of sickness and maintenance of health among the people of the United States.

An appropriation of \$78,500 by the Rockefeller Foundation has made possible the expansion of the Council's national health program.

"We are most fortunate," said Mr. Mather, Boston industrialist, "to have induced Mr. Burritt to come out of retirement and devote his unique abilities to Council activities until a national leader in public health work can be secured as a permanent director."

Mr. Burritt, who will begin his new duties immediately, was from 1914 to 1939 general director of the New York Association for Improving the Condition of the Poor, and from 1939 to 1944 senior executive director of the Community Service Society of New York. Throughout his career he has been instrumental in bringing health services within the reach of thousands of New York families.

Since his retirement in 1944, Mr. Burritt has continued many important activities in behalf of health organizations. He was president of Neighborhood Health Development, Inc., for more than a decade. He is now president of the New York Tuberculosis and Health Association; chairman of the Executive Committee of the American Social Hygiene Association; member of the Board of Directors of the Community Service Society, the Judson



*Bailey B. Burritt*

Health Center, and the National Tuberculosis Association; and member of the Health Advisory Council of the U. S. Chamber of Commerce.

The National Health Council, which began to function in 1921, comprises representatives from such major organizations as the National Tuberculosis Association, the American Cancer Society, the American Heart Association, the American Public Health Association, the American Red Cross, the National Organization for Public Health Nursing, and the National Safety Council. It has headquarters at 1790 Broadway, New York City, where it maintains a number of services that are available to all health agencies.

Besides working as a unifying and coordinating agency among national health organizations, the National Health Council cooperates with state and local groups in their efforts to improve health services. One of the aims of the expanded program is to make a qualified field service available to states and cities where the problem of coordi-

nation among voluntary health agencies is urgent. It is also planned to expand health education services available to member agencies of the Council.

#### PUBLIC HEALTH FEATURES OF CENTENNIAL, NEW YORK ACADEMY OF MEDICINE

The New York Academy of Medicine will celebrate in March and April, 1947, the 100th Anniversary of its founding. The program will reflect the profound and dramatic changes in man's mode of living and in his ways of thinking during this century. Many of the basic sciences upon which medicine of today rests were, a hundred years ago, either completely unknown or rudimentary. The major theme of the centennial will be "The Rôle of Medicine in the Changing Social Order of Today."

The preliminary program includes the following items:

March 6—Centennial Dinner—Waldorf Astoria Hotel

Guest speaker—Sir John Ryle, Professor of Social Medicine, Oxford University, England

"Social Pathology and the New Era in Medicine"

Other public health features will include:

March 19-21—Institute on Social Medicine

April 1-3—Institute on Public Health

Among the subjects to be considered at the Institute are Genetics in Public Health; Maternal Health—A Problem in Preventive Medicine; The Animal Kingdom—A Reservoir of Disease; Climate, Geography and Disease; Realities in Preventive Psychiatry; and Society's Support of the Public Health.

It is understood that the attendance at the conferences will be by invitation of the Academy.

Hermann M. Biggs Memorial Lecture by Dr. Haven Emerson of New York will take place on the evening of April 3 and will be preceded by a session of the Public Health Association of New York City.

#### ENGINEERING STUDENTS COURSE

Engineering students who are not interested in specific training in industrial hygiene and sanitary engineering can now obtain some knowledge of those subjects through a 12 week course offered by the Department of Public Health Engineering of the Georgia School of Technology. The Georgia School of Technology in making the above announcement recently, goes on to explain that by this training it is hoped to lessen the work of sanitary and industrial hygienists by teaching other engineers some of the problems confronting these health workers. George W. Reid, Associate Professor of Sanitary Engineering and Industrial Hygiene at Georgia Tech, will be in charge of the work, assisted by V. N. Hendrick of the Georgia State Department of Health. Three lectures a week will be given during the course.

#### ADVANCED COURSE IN OBSTETRIC NURSING

The University of Chicago has announced an advanced clinical course in obstetric and pediatric nursing set up to meet the increasing need for well qualified nurses to serve on advanced levels of responsibility in the field of obstetric nursing. The course is designed for both public health and institutional nurses who wish to specialize, and covers a 6 month period. The next class will be admitted March 26, 1947. For further information address Nursing Education, University of Chicago, 5733 University Avenue, Chicago 37, Ill.

#### BIGGS MEMORIAL LECTURE BY HAVEN EMERSON

The 1947 Hermann M. Biggs Memorial Lecture of the New York Academy of Medicine will be given on Thursday, April 3, at 8:30 P.M. by Haven Emerson, M.D., Emeritus Professor of Public Health Practice of

Columbia University. His subject will be "The Hospital Survey and Construction Act and a Nation-wide Health Program." It will be given under the auspices of the Academy's Committee on Public Health Relations at the concluding session of a three day Institute on Public Health which will be one of the features of the Academy's Centennial Celebration. At the same session Senator H. Alexander Smith of New Jersey will speak on "Government and Medicine." This session held at the Academy's auditorium, 5th Ave. and 103rd St., New York, will be open to the general public.

#### NURSE COUNSELING AND PLACEMENT OFFICE

The Nurse Counseling and Placement Office, New York City, reports more than 2,000 placements in its first year of activity. Established in November, 1945, this office is under the technical supervision of a full-time professional nurse consultant. Applicants served include professional nurses on a nation-wide basis, practical nurses, medical and x-ray technicians, doctors' and dentists' assistants, and physical therapists.

Six hundred and thirty-eight placements of professional nurses were made in all fields of nursing. Public health nurses were placed in urban and rural official and private agencies, both in and out of New York. Many excellent opportunities for public health nurses went unfilled because of a shortage of well qualified applicants, particularly in the fields of supervision and administration. Conversely, some well qualified applicants were not placed because of limitations they set on their availability, *i.e.*, location, type of agency, salary.

The Nurse Counseling and Placement Office has many interesting public health positions open and a number of experienced public health nurses available for placement. Employers are in-

vited to list their needs for nurse personnel; and nurses who are planning to move on to different employment opportunities are invited to register for placement. There is no fee either to employer or applicant.

Inquiries should be addressed to Nurse Counseling and Placement Office, New York State Employment Service, 119 West 57th Street, New York 19, N. Y.

#### INTERNATIONAL EXCHANGE OF PUBLIC HEALTH SPECIALISTS THROUGH UNITED NATIONS

Through the World Health Organization, the United Nations will initiate a system of postgraduate fellowships in public health, medicine, sanitary engineering, and nursing. Under the program, 30 postgraduate students will be selected to study for a year in the United States, Canada, and other countries.

In addition, 10 advanced specialists will receive travel grants in medicine and public health to spend three months in the United States and Canada, learning latest techniques in their fields.

This plan was recently announced by the United Nations as part of a program to spread information about the latest medical advances.

#### DR. N. W. VAUX APPOINTED PENNSYLVANIA STATE SECRETARY OF HEALTH

Norris Wistar Vaux, M.D., of Philadelphia has been appointed Secretary of Health in Pennsylvania by Governor Duff, succeeding Harry Weest, M.D. Dr. Vaux has until recently been Professor and Head of the Department of Obstetrics at Jefferson Medical College in Philadelphia.

#### DR. GILL APPOINTED ALABAMA STATE HEALTH OFFICER

D. Gordon Gill, M.B., D.P.H., Montgomery, Ala., has been appointed State

Health Officer of Alabama to succeed Burton F. Austin, M.D., who has resigned to become a staff member of the American National Red Cross. Dr. Gill, who is a graduate of the University of Toronto, received his D.P.H. from the University of Toronto in 1924, and has been the Director of the Bureau of Preventable Diseases in the Alabama State Department of Health. He is a Fellow of the Epidemiology Section of the A.P.H.A.

#### MENTAL HEALTH RADIO PROGRAMS

The National Mental Health Foundation has prepared a radio series—"For these we speak"—designed for sponsorship over local radio outlets by mental hygiene societies or other agencies concerned with the problem. Each program is a dramatic treatment of one particular problem with the general aim of educating the American public to a sympathetic understanding of the mentally ill. Brief introductory remarks by Helen Hayes, Harry Emerson Fosdick, Eleanor Roosevelt, and Mary Jane Ward are provided. Address inquiries to Radio Section, National Mental Health Foundation, Box 7574, Philadelphia 1, Pa.

#### GROWTH OF CANCER DETECTION CLINICS

With the opening of a cancer detection center in Buffalo, N. Y., late in 1946, the American Cancer Society reports that there are now 86 such clinics in 20 states under the auspices of state or local units of the Society. During the year 54 of these centers were organized. The Society estimates a total national need for about 2,500.

A cancer detection center is set up for the purpose of detecting cancer in apparently well persons who show no symptoms of cancer. As such, these clinics do not offer full diagnosis, x-ray, or biopsy. Patients showing symptoms are sent to diagnostic clinics.

Diagnostic clinics have complete fa-

cilities for diagnosis of cancer but refer patients back to their private physicians or other clinics for treatment.

The Society reports that at the end of 1946 there were 40 diagnostic clinics throughout the country, with an estimated need of about 2,250. It further estimated that there were presently 400 treatment clinics, with an estimated need of 2,000.

#### DR. PLOTZ, TYPHUS EXPERT, DIES

Harry Plotz, M.D., died at Walter Reed Hospital in Washington on January 6 after having suffered a heart attack while at work in his laboratory at the Army Medical Center.

During the first World War he invented the Army delouser to which every American soldier was submitted before sailing with the American Expeditionary Force.

After anti-typhus service in many parts of Europe following World War I, Dr. Plotz joined the Pasteur Institute in Paris where he not only collaborated in developing a technique for mass production of an anti-typhus vaccine but also discovered the measles virus. At the time of his death he was a consultant to the U. S. Secretary of War, having retired a year earlier as head of the virus division of the Army Medical Corps.

#### DR. RAJCHMAN NAMED HEAD OF UNITED NATIONS CHILDREN'S EMERGENCY FUND

Dr. Ludwig Rajchman, Polish delegate to the United Nations, and Polish representative to UNRRA, has been unanimously elected as chairman of the board of the International Children's Emergency Fund by its executive board. For 18 years director of the League of Nations Health Organization, Dr. Rajchman helped to organize the Fund as an international agency for aiding young war victims.

The executive director of the Fund

has also been announced by Secretary General Trygve Lie of the United Nations. He is Maurice Pate, who was an aide to Herbert Hoover in the first World War Relief Commission as well as in the 1945 survey of world food supplies. During the recent war years he served as President of the Commission on Polish Relief and later as Director of the Prisoners' War Relief Division of the American Red Cross.

The International Children's Emergency Fund was created by the United Nations General Assembly on the recommendation of a subcommittee representing the Social Commission of the Economic and Social Council. Its stated purposes are "for the benefit of children and adolescents of countries which were victims of aggression and of countries receiving UNRRA relief, and for child health purposes generally, giving high priority to the children of countries victims of aggression." The Fund's assets may be contributions from UNRRA, from governments and from voluntary and individual sources. Its work may be undertaken in any country only with the consent of the government concerned.

#### RAILROAD SANITATION GETS ATTENTION

In the spring of 1946 the Association of American Railroads organized its Sanitation Research Project, under the direction of Abel Wolman, Dr.Eng. as Consultant Director. Its purpose is to study and make improvements in railway sanitation. Its first primary objective is the development of a sanitary means of handling and disposing of sewage wastes from passenger cars. Two appointments to the staff of the project have recently been announced by Dr. Wolman: Frederick G. Whelan, Ph.D., who received his doctorate at The Johns Hopkins University School of Engineering, where he was Research Assistant and Instructor in Electrical Engineering, will serve as electrical

engineer of the project. Ralph F. Vaccaro, as bacteriologist, will supervise all bacteriological-chemical activities. He is an alumnus of the Graduate School of the Massachusetts Institute of Technology, served for 2½ years in the Army Medical Department and, since February, 1946, has been Senior Sanitary Engineering Aide in the Massachusetts Department of Public Health.

#### UNIVERSITY OF MINNESOTA ADDS COURSE IN HOSPITAL ADMINISTRATION

With the beginning of the current academic year, the University of Minnesota School of Public Health became the fifth university to offer a course in hospital administration. According to an announcement by Dr. Gaylord Anderson, Director of the school, the course will be open only to students holding at least a bachelor's degree. At the outset the enrollment will be limited to 20. The program will be administered by a university committee consisting of the Dean of the School of Business Administration, the Superintendent of University Hospitals, and the Director of the School of Public Health.

This new course has been made possible by a grant from the W. K. Kellogg Foundation—\$20,000 for each of three years, at the end of which time it is expected to become a part of the university's regular curriculum if it has demonstrated its value.

In announcing the new course, Dr. Anderson pointed out that the demand for competent and experienced hospital administrators far exceeds the available supply, and that as a result many administrators have come to their duties with inadequate backgrounds, resulting inevitably in inefficiency and loss of public money. He added also that positions in hospital administration usually pay good salaries.

The other schools offering similar courses are Chicago, Columbia, and Northwestern Universities and Washing-



ton University at St. Louis. Applicants in these courses are about 20 times the number that can be accepted.

Applicants for the course at Minnesota should consult with Dr. Anderson, Minnesota School of Public Health, Minneapolis.

#### McGraw-Hill Nursing Book Prizes Announced

*Counseling Programs in Schools of Nursing*, under the joint authorship of three members of the University of Minnesota faculty has been awarded the first prize of \$1,000 in the national contest sponsored by McGraw-Hill for the outstanding books on nursing. Scheduled for May publication, its authors are H. Phoebe Gordon, assistant to the director of the School of Nursing, Katharine J. Densford, R.N., director of the School of Nursing and president of the American Nurses Association, and Edmund G. Williamson, dean of students.

The second award, \$400, went to Helena Willis Render for *Nurse-Patient Relationships in Psychiatry*. Dr. Bert I. Beverly, with *A Psychology of Growth*, and Dr. Edith L. Potter, with *Fundamentals of Human Reproduction*, tied for third place and received \$100 each.

#### A Bill to Authorize County Health Departments in New Jersey

The January 19 *News Letter* of the New Jersey Health and Sanitary Association says, "Whether or not it is a direct result of the regional meetings sponsored by the Association, a considerable amount of interest has been evident recently in 'Better Rural Health Administration.' Perhaps the unanimous disapproval of things as they are expressed by those who attended these meetings, had something to do with it."

It then reports on a bill that has been introduced in the 1947 Session of the

New Jersey State Legislature. Prepared upon the invitation of the State Department of Health by a Joint Committee of the New Jersey Health and Sanitary Association and the New Jersey Health Officers Association, it is said to be the first attempt to move responsibility for New Jersey's local health services into larger areas of jurisdiction by using the subsidy principle. There have been earlier attempts, under a permissive law, to establish "regional units"—Multiple municipalities.

Modeled to some extent on the New York State law under which health service in rural areas is being reorganized, it authorizes the establishment of county health departments in the 14 non-urban counties of the state with populations of less than 200,000. These counties have less than one-fourth of the state's population and practically all of its rural areas.

The bill provides for one county or part-county health district in each of the 14 counties, which need not include cities with populations of 25,000 or more unless their governing bodies wish to be included, nor smaller cities if the county health officer, in coöperation with the State Director of Health, determines that their health services are adequate and efficient by definite standards to be set up. All areas in the county would participate in the tax whether included in the county services or not.

The county or part-county health district may be organized on petition of the Freeholders (Board of Supervisors) to the State Director of Health. When organized its health officer must hold a New Jersey Health Officer's license and devote full time to his work. He is assured a term of four years. The administrative body is a county board of health of 7 members, only one of whom may be a Freeholder and not more than three of whom may be physicians.

State aid to county health districts is authorized through a provision whereby, upon request of the Freeholders, the state may grant aid up to 50 per cent of the total local health department budget, but in no event to exceed \$1 per capita of the district population.

Dennis J. Sullivan, Director of the Sanitary Division of Jersey City's health services, served as chairman of the committee which prepared the bill. This committee in explaining "why this is a good bill" said in part, "The County Health Department plan has been used successfully for a long time in other parts of the country, especially in the South and West. Its advantages are now being realized in the North and East. New Jersey can benefit from many other states' experience. Our bill, if passed, will be a base on which to build conservatively and well toward one of our greatest needs—better public health in our less densely populated areas. It is for this purpose, and no other, that the bill is presented."

#### JOHN J. BLOOMFIELD TO BOLIVIA

The Institute of Inter-American Affairs recently announced that John J. Bloomfield, Assistant Chief of the Industrial Hygiene Service, U. S. Public Health Service, began a two month tour of duty in Bolivia as special consultant to the Institute's labor inspection and industrial health program. On request of the Bolivian Health Ministry, the Institute is coöperating in a program to improve the economic status of Bolivian workers, particularly miners. In this program Mr. Bloomfield will assist in the formulation of codes to establish safe and healthful conditions in industry and in clarification of occupational disease compensation laws.

#### INDUSTRIAL MEDICINE FELLOWSHIP

##### AT PITTSBURGH

A Fellowship in Industrial Medicine

has been established at the University of Pittsburgh School of Medicine by the Schenley Distillers Corporation, according to a recent announcement by T. Lyle Hazlett, M.D., Director of the university's Department of Industrial Hygiene. The Fellowship carries a residency of 18 months at the School of Medicine. Further particulars may be secured by writing to the Director, Department of Industrial Hygiene, School of Medicine, University of Pittsburgh, Pittsburgh 13.

#### NEGLECTED AREAS WILL HAVE HOSPITAL CONSTRUCTION PRIORITIES

Thomas Parran, M.D., Surgeon General of the U. S. Public Health Service, recently announced that neglected rural areas and minority groups will receive priorities in the administration of the hospital survey and construction act passed by the 1946 session of Congress. The law provides for priorities in rural areas and in localities where groups are less than adequately served because of race, creed, or color.

#### PERSONALS

##### Central States

CHARLES M. GIBBS, M.D., after serving many years, recently resigned as Greenfield, Ind., City Health Officer. His successor will be R. E. KINNE-MAN, M.D., Greenfield.

DAN MORSE, M.D., recently of Columbus, Ohio, has been appointed Medical Director and Superintendent of the Peoria, Ill., Municipal Tuberculosis Sanitarium, succeeding MAXIM POLLAK, M.D., recently resigned.

##### Eastern States

BAILEY B. BURRITT† was reëlected President of the New York Tuberculosis and Health Association at their annual meeting. All other officers also were reëlected for a second term. They were Vice-President, O. R. JONES, M.D.; Secretary,

MYRON I. BORG, JR.; Treasurer, H. P. DAVISON.

JAMES M. DUNNING, D.D.S.,† has been appointed Associate Dean of the Faculty of Medicine and Dean of the Harvard University School of Dental Medicine in Boston. Dr. Dunning is a graduate in dentistry from Columbia University in 1930 and has been President of the Dental Health Service of New York City. For the past year he has been a Fellow in Public Health Dentistry at the Harvard School of Dental Medicine.

SIGMUND L. FRIEDMAN, M.D.,† formerly Assistant Director, Beth Israel Hospital, Boston, Mass., has been appointed Executive Director of Sydenham Hospital, New York, N. Y., effective February 3.

D. B. GLEZEN, M.D., of Cincinnati, N. Y., has been appointed Deputy Commissioner of Health of Cortland County, N. Y., effective January 1. Dr. Glezen has been a member of the Cortland County Board of Health for 16 years and in 1946 was in charge of the department's social disease clinics.

EDWARD S. GODFREY, JR., M.D.,\* Albany, N. Y., has been reappointed New York State Commissioner of Health by Governor Dewey.

FRED KARUSH, Ph.D., has been awarded a three year senior fellowship by the American Cancer Society for research at New York University College of Medicine, New York, N. Y., under the direction of R. KEITH CANNON, D.Sc., Department of Chemistry. Dr. Karush has been with the Du Pont Chemical Company in New York City for five years.

I. NEWTON KUGELMASS, M.D., has been appointed Consultant Nutritionist to the Department of Health and the Department of Hospitals, New York City.

ELISE D. S. L'ESPERANCE, M.D., Head of a Cancer Clinic in the New York Infirmary for Women and Children and of a similar clinic in Memorial Hospital for the Treatment of Cancer and Allied Diseases, New York, N. Y., was awarded the 1946 medal of the American Women's Association. The medal was presented at a dinner held by 44 business and professional women's group.

AARON EDWIN MARGULIS, M.D., has been appointed Professor of Bacteriology and Director of the hospital and dispensary services of bacteriology in the New York Post-Graduate Medical School and Hospital, Columbia University, New York City, to succeed WARD J. MACNEAL, M.D., deceased.

JAMES L. MCCARTNEY, M.D.,† has been appointed consulting psychiatrist for the Great Neck Public Schools, New York, N. Y. Dr. McCartney, a veteran of the recent war, was for several years Chief of the Division of Mental Hygiene of the Connecticut State Department of Health.

JERE J. McEVILLY, M.D., has been appointed Health Officer of Little Falls, N. Y., to succeed AUGUSTUS B. SANTRY, M.D., who held the office for 25 years.

THOMAS I. PARKINSON, President, Equitable Life Assurance Society, New York, has been appointed Chairman of the National Advisory Committee of the American Heart Association. The announcement was made February 3, by HOWARD F. WEST, M.D., President of the Association. Dr. West also announced that the Committee consists of HAROLD F. STASSEN, former Governor of Minnesota and 22 prominent laymen.

ELIZABETH ANN PORTER† has been appointed Nutritionist, Bureau of Preventable Disease Control, New Jersey State Department of Health. Miss Porter was formerly with the

\* Fellow, A.P.H.A.

† Member, A.P.H.A.

Pennsylvania State Department of Health as Nutritionist.

ELIAS PRATT, M.D., after 56 years of medical practice in Torrington, Conn., has presented his resignation as City Health Officer and School and City Physician, posts which he has filled for many years. Dr. Pratt has also served as President to both the Connecticut State Medical Society and the Litchfield County Medical Association.

EDWARD C. REIFENSTEIN, JR., M.D., formerly Harvard Medical School research fellow at the Massachusetts General Hospital, Boston, has been appointed Research Consultant to the Sloan-Kettering Institute for Cancer Research at the Memorial Hospital Cancer Center, New York, N. Y., and also Clinical Research Consultant to Ayerst, McKenna and Harrison, Ltd. He will carry on clinical research on the relation of glandular disturbances of cancer.

EDWARD S. ROGERS, M.D.,\* assumed his duties as Dean of the University of California School of Public Health, Berkeley, Calif., in February. Dr. ROBERTS has been Assistant Commissioner in the New York State Department of Health. WILLIAM McD. HAMMON, M.D.,† who has served as Acting Dean, will continue as faculty member.

CLARENCE N. SMITH, M.D., an Officer of the regular Navy since 1918, has been appointed Industrial Medical Consultant for the eastern area of Pennsylvania for the Bureau of Industrial Hygiene, Pennsylvania Department of Health.

ROYAL W. WILLIAMS, M.D., Surgeon U.S.P.H.S. (R), has recently received a promotion to Senior Surgeon and will be in charge of the Bureau of Internal Revenue, Washington, D. C., as Chief Medical Officer.

## Southern States

### CHANGES IN HEALTH PERSONNEL IN ALABAMA:

A. M. SHELAMER, M.D.,† is County Health Officer of Madison County, instead of J. L. CARPENTER, M.D., as reported in the January *Journal*. Dr. Carpenter has been appointed a County Commissioner of Madison County.

CLARA ARRINGTON has been appointed as Physical Therapy Consultant on the staff of the Division of Health Services of the U. S. Children's Bureau, in Washington, D. C. She had previously served as Chief Physical Therapist in an Army general hospital treating orthopedic and other injury cases, and as physical therapy instructor at Northwestern University Medical School.

ARTHUR N. BECK has been appointed Chief Engineer and Director of the Bureau of Sanitation, Alabama State Department of Health.

JOHN F. BUSCH, M.D., Columbia, S. C., was recently appointed Assistant Chief of the Tuberculosis Division of the Department of Medicine and Surgery for the Veterans Administration in five southeastern states. For the past two years Dr. Busch has been Medical Director of the South Carolina Tuberculosis Association.

RANDOLPH L. CLARK, JR., Jackson, Miss., has been appointed Director of the M. D. Anderson Hospital for Cancer Research in the Texas Medical Center, Houston. Dr. Clark has been on the surgical staff of the Mayo Clinic and Consultant in Surgery at the Mississippi State Charity Hospital, Jackson, and the Mississippi State Tuberculosis Sanatorium. He was also Director of the Department of Surgery, AAF School of Aviation, Randolph Field, Texas, and was Chief of the Surgical Service AAF Technical Training School.

\* Fellow, A.P.H.A.

† Member, A.P.H.A.

VICTOR F. CULLEN, M.D., was honored with a dinner in Baltimore, December 31, 1946, to mark his retirement as superintendent of all Maryland tuberculosis sanatoria. Dr. Cullen graduated from Johns Hopkins University Medical School and while an intern at St. Joseph's Hospital is said to have developed tuberculosis. After two years of care and treatment in a sanatorium he returned to Maryland. According to the governor, Dr. Cullen is "the father of modern tuberculosis work in Maryland." He is also a past president of the National Tuberculosis Association.

#### CHANGES IN HEALTH PERSONNEL IN FLORIDA:

THOMAS E. MORGAN, M.D., was appointed on January 1, as Health Officer in Duval County with headquarters at Jacksonville. Dr. Morgan was with the State Board of Health before entering the Service.

L. L. PARKS, M.D.,† who has been director of the Duval County Health Department since his return from the A.U.S., has resigned and has been appointed director of the recently organized Field Technical Staff.

JAMES H. WELLS, M.D.,† recently in charge of the Southeastern Florida Health District, was on January 1 appointed Director of the new unit composed of Brevard and Osceola Counties. His headquarters will be at Titusville and Kissimmee.

EDWARD F. REASER, M.D., formerly Assistant Superintendent of the Huntington, W. Va., State Hospital has been named Supervisor and Chief Psychiatrist at a newly established Mental Hygiene Clinic in Huntington. The Clinic has been opened by the Veterans Administration and it

is the first of its kind ever established in West Virginia.

HOWARD C. STEWART, M.D.,\* Franklin, Tenn., has been appointed Health Officer of Lincoln to succeed LEROY L. FATHERREE, M.D.,\* who resigned to take a similar position in Omaha.

#### Western States

CHARLES CALHOUN, M.D., former Health Officer of Kings County, California, has been appointed Health Officer of Tulare County. Dr. Calhoun held full-time county health offices in Virginia and West Virginia before his first appointment in California in 1943.

ELAINE A. SCHWINGER, M.D., Georgetown, S. C., has been appointed Junior Field Physician for the Territorial Department of Health of Alaska. The Territorial Health Department has announced the resignation of N. BERNETA BLOCK, M.D., Juneau, as Director of the Division of Maternal and Child Health and Crippled Children's Services.

HOWARD F. WEST, M.D., has been appointed to the newly created position of Medical Director of the Los Angeles, Calif., County Department of Charities. Newspapers report that Dr. West will serve as Medical Adviser to County Superintendent of Charities, ARTHUR J. WILL, and the Medical Directors of the various hospitals and will "Carry on scientific and professional activities relating to medical policies, problems and programs of the county." Dr. West is president of the American Heart Association and Clinical Professor of Medicine at the University of Southern California.

#### Foreign

PAUL F. RUSSELL, M.D.,\* of the International Health Division of the Rockefeller Foundation, now assigned to service in Venezuela, has been

\* Fellow, A.P.H.A.

† Member, A.P.H.A.

awarded the Walter Reed Medal for 1946 for meritorious achievement in tropical medicine. During World War II, Dr. Russell was commissioned a lieutenant colonel and was assigned to the Surgeon General's Office, where he conceived the idea of forming malaria survey units and malaria control units, the organization and training of which he planned, later going to Algiers as Director of the Allied School of Malaria and Chief Malariologist of the Allied forces in the North African Theater. He returned to the United States in 1944 and became Chief of the Division of Parasitology at the Army Medical School, Washington, D. C., until his return to civilian life early in 1946.

#### Puerto Rico

E. GARRIDO MORALES, M.D., DR.P.H., San Juan, has been appointed Program Director for District No. 6, Hospital Facilities Division, U. S. Public Health Service, and Consultant to the Tuberculosis and Venereal Disease Programs coöperatively carried out by the Insular Health Department with grant-in-aid federal funds.

#### Deaths

ADAH L. HERSHEY,\* Director of the Des Moines Public Health Nursing Association for 33 years, died January 8, 1947, in Los Angeles, Calif., while on leave from her position in Des Moines because of ill health. One of her outstanding accomplishments was the developing and coördinating of city, county, and school nursing services in Des Moines and Polk Counties. The pattern developed here has been followed in many communities all over the country. Miss Hershey became a member of the

American Public Health Association in 1920 and a Fellow in 1934.

SYLVESTER LAMBERT, M.D., in retirement since 1939, died at his California home on January 10. For 20 years previous to 1939 he had served in the South Sea Islands with the International Health Division of the Rockefeller Foundation. Here he was known especially for his work in eradicating hookworm and in setting up the Central Native Medical School at Suva, Fiji.

SAMUEL MORRIS, M.D., Assistant Professor of Zoölogy at Howard University, Washington, D. C., died February 6 at the age of 51. From 1929 until 1932 Dr. Morris was instructor in zoölogy at the University of Pennsylvania and later was an instructor in biology at Temple University. He also had been professor of biology at Scranton-Keystone Junior College. During the war he was an anti-typhus specialist in the United States Department of Hygiene.

CHARLES A. O'QUINN, M.D., of Madison, Fla., died on December 9, 1946. Dr. O'Quinn had long been connected with the Florida State Board of Health as a local health officer, recently in the Taylor and Madison County Unit.

AFRANIO PEIXOTO, M.D., Professor Emeritus of Hygiene at the Rio de Janeiro University, died recently.

#### CONFERENCES AND DATES

American Dental Association—Annual Meeting. Boston, Mass. August 4-8.

American Dietetic Association. San Francisco, Calif. October 13-17.

American Hospital Association. Annual Convention. St. Louis, Mo. September 22-25.

American Public Health Association—75th Annual Meeting. Atlantic City, N. J. October 6 to 10.

American Water Works Association:

Annual Convention. San Francisco, Calif. Week of July 21-25.

Four States Section. Washington, D. C. November 19-21.

\* Fellow, A.P.H.A.

† Member, A.P.H.A.

- Illinois Section. Congress Hotel, Chicago, Ill. April 17-18.  
 Indiana Section. Antlers Hotel, Indianapolis, Ind. May 7-9.  
 Kansas Section. Hotel Broadview, Wichita, Kansas. March 13-14.  
 Minnesota Section. Lowry Hotel, St. Paul, Minn. March 13-15.  
 Montana Section. Havre, Mont. April 25-26.  
 New Jersey Section. Atlantic City, N. J. November 6-8.  
 New Jersey Section. Outing. June 19.  
 New York Section. Hotel Statler, Buffalo, N. Y. April 10-11.  
 Ohio Section. Columbus, Ohio. September 30-October 1.  
 Pacific Northwest Section. Victoria, B. C. May 15-17.  
 Virginia Section. Roanoke, Va. November 17-18.  
 Child Study Association of America. Annual Conference. Hotel Roosevelt, New York, N. Y. March 10.  
 Federation of Sewage Works Associations. San Francisco, Calif. July 22-24.  
 Georgia Water and Sewage Association. Georgia School of Technology. Atlanta, Ga. September 17-19.  
 Indiana State Medical Association. 98th Annual Session. Lick Springs Hotel, French Lick, Ind. October 28-30.  
 Interstate Post Graduate Medical Association of North Carolina. Public Auditorium, St. Louis, Mo. October 13-17.  
 New England Institute. Durham, New Hampshire. June 16-18.  
 New England Institute. Conference for Health Workers. Massachusetts State College, Amherst, Mass. September 11-12.  
 New York Tuberculosis and Health Association. Annual Conference. Hotel Pennsylvania, New York, N. Y. March 20.  
 Society of the American Bacteriologists. Annual Meeting. Bellevue-Stratford Hotel, Philadelphia, Pa. May 12-16.  
 Third Industrial Waste Utilization Conference. Purdue University, Lafayette, Ind. May 21-22.

ORDER ANY NUMBER OF

"SUGGESTED SCHOOL HEALTH POLICIES"

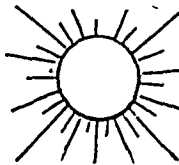
FROM

HEALTH EDUCATION COUNCIL

10 DOWNING STREET • NEW YORK 14, N. Y.

48 pages 25¢ You get quantity discounts

# HOW TO LIVE



By Irving Fisher, LL.D., and  
Haven Emerson, M.D.

**NEW, COMPLETELY REVISED EDITION  
NOW READY!**

HOW to guard your health—your most precious possession! Let an eminent professor and a distinguished doctor tell you in plain everyday language, how to care for your body and your mind. This wonderful book, which sold 469,000 copies in earlier editions, has now been completely revised to include the latest discoveries of modern science on healthful living, and covers prevention of disease, use of alcohol and tobacco, mental serenity, mouth diseases, what food to eat, and many other topics. A really dependable book based on latest scientific fact. Get your copy today!

\$2.50 at bookstores or

**FUNK & WAGNALLS COMPANY**

153 East 24th St., New York 10

## LaMOTTE

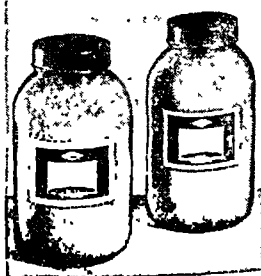
### Standardized Buffer Salts and Standardized Buffer Solutions

These LaMotte products are the ultimate in purity and uniformity. Packaged in special containers,



they are guaranteed to give consistently accurate results. LaMotte Standardized Buffer Solutions are freshly prepared from LaMotte Buffer Salts. Concentrations are M/5 except Sodium Citrate which is M/10. Specially packaged to prevent mold growth and contamination. Container sizes 100, 250, 500 and 1000 cc.

LaMotte Standardized Buffer Salts are specially purified and standardized for the preparation of Clark & Lubs Buffer Solutions and Buffer Mixtures. Supplied in 50, 100, 250 and 500 gram containers.



Write for further information and prices  
**LaMOTTE CHEMICAL PRODUCTS CO.**  
 Dept. "PH" Towson 4, Maryland

# American Journal of Public Health

## and THE NATION'S HEALTH

---

Volume 37

April, 1947

Number 4

### Dust and Its Control as a Means of Disinfection of Air<sup>\*†</sup>

THE bacterial content of dust found in homes, schools, factories, offices and hospitals varies with the different environments. Saprophytic organisms usually predominate, but parasitic and pathogenic agents may be found in large numbers. Both healthy<sup>1,2</sup> and ill<sup>3</sup> individuals more or less continually extrude bacteria into their environments in secretions and excretions from: (a) the respiratory tract (nose and throat secretions, sputum, ear, mastoid and sinus discharges); (b) the gastrointestinal and urinary tracts (feces, vomit, urine); (c) skin (scales and hair, septic skin lesions, mucous membrane, conjunctiva and vagina); and (d) wounds (discharges from septic wounds, burns and abscesses). While dust in the outside atmosphere may not be dangerous, that which is found in intramural environments inhabited by human beings should always be considered a potential source of disease agents.<sup>4</sup>

*Rationale for controlling dust-borne organisms*—Dust as a vehicle for the spread of disease agents has been studied

particularly in relation to respiratory tract infections, skin infections, and secondary infections of burns and wounds. Large numbers of hemolytic streptococci,<sup>5</sup> staphylococci,<sup>6</sup> pneumococci,<sup>7</sup> diphtheria bacilli,<sup>8</sup> and tubercle bacilli<sup>9</sup> have been demonstrated in the floor dust on hospital wards. These organisms have been shown to survive in the environment for long periods of time. Little is known concerning the survival of viruses in dust. Influenza A virus, however, has been shown to survive in floor dust up to ten days without loss of its ability to produce infection in susceptible animals.<sup>10</sup> The great proportion of organisms expelled from the respiratory tract in droplets and droplet nuclei eventually settle to form a part of the bacterial component of dust. The relative importance in the spread of disease of droplets and droplet nuclei initially extruded in the air and those raised again as dust is not known. All three modes of spread probably occur, but vary in importance with different age groups of people, diseases, environments, and seasons of the year.<sup>40</sup>

In a recent report Wells, Winslow, and Robertson<sup>14</sup> have classified the activities of air-borne microorganisms according to whether they invade the atmosphere on dust particles, in droplets, or in droplet nuclei. In the present

---

\* Report of the Referee on Suppressive Measures for the Control of Dust, of the Standard Methods Committee for the Examination of Germicides and Antibacterial Agents.

† Special Review Article prepared at the request of the Editorial Board.



writer's opinion, however, there is not sufficient knowledge of the rôle which dust, droplets, and droplet nuclei play in the transmission of disease to warrant such a correlation. Employing the hemolytic streptococcus as an index of environmental contamination, it has been shown in hospital wards<sup>3, 11</sup> and army barracks<sup>12, 13</sup> that when small numbers of these organisms are isolated from the air they can be found in proportionately larger numbers in the floor dust and bedclothes. There is no evidence to indicate that these dried dust-borne pathogens are any less noxious than those drifting about in droplet nuclei. Certainly one cannot predict the type of infection that a given respiratory tract pathogen will produce on the basis of whether it is inhaled as dust particles recently swept into the air from the floor, as droplets recently expelled from the nose and throat, or as droplet nuclei which have been suspended in the air for some length of time.

Dust, which may carry pathogenic agents, is raised into the air by sweeping, bedmaking, and other activities, and eventually settles on all surfaces in enclosed spaces. Thus, the opportunities for spread of infection by direct or indirect contact with these "environmental reservoirs" are many. For example, in hospital wards streptococci disseminated through the air as dust-borne particles "settle out" on the furniture (bedside tables, nurses' desks, chairs, instruments, tables, carts, etc.), on food, on toys, on the skin, hands, and clothes of the patients and hospital personnel (nurses, doctors, attendants, and visitors), and again on the floor and bed surfaces.<sup>4</sup> Respiratory tract infections may be acquired from the inhalation of these dust-borne organisms, or by direct transfer from a dusty surface to the nose and mouth by the hands, instruments, etc. In other situations they may settle onto exposed clean wounds and burns,

or be transferred to them directly from dusty surfaces by the hands, dressings and instruments, resulting in secondary infections.<sup>4, 15, 20</sup>

There are now ample data to show that dust is an important vehicle for the spread of certain diseases of bacterial and virus etiology in the laboratory,<sup>16, 17</sup> hospital wards,<sup>18-21</sup> and army barracks.<sup>13</sup> It most likely plays an equally important rôle in the spread of infections in schools and homes. Ultra-violet light,<sup>22</sup> glycol vapors,<sup>23</sup> and hypochlorous acid<sup>24</sup> employed in the disinfection of air have only a limited effectiveness against dried dust-borne organisms. Therefore, the use of dust- and lint-control measures alone or in conjunction with these techniques is of importance.

*Methods of Dust Control*—Extensive studies by English<sup>25-27</sup> and American investigators<sup>28-30</sup> have shown that oil is the most highly effective and economical compound for the treatment of surfaces and fabrics for the suppression of dust and lint. A review of the literature up to May, 1944, on the development of techniques of application of oil to floors and bedclothes and the use of these dust-suppressive measures for the control of dust-borne bacteria and respiratory tract infections has been made.<sup>31</sup> Since that time studies have been reported or are in the process of completion which have been concerned both with the further development and refinement of techniques of application of oil, particularly to fabrics, as well as with the control of respiratory disease among army personnel by the oiling of floors and bedding. Certain studies which were referred to in the previous report will again be discussed.

*Technique of oiling floors*—Most oil companies make a special grade of floor oil which meets government specifications concerning fire hazards, and which is also suitable for use on floors for dust-control purposes.<sup>32</sup> The application of oil to floors in army barracks is

a simple procedure and can be applied with unskilled help. The floors in army barracks are usually constructed of soft wood, which absorbs large amounts of oil—approximately one gallon per 200 sq. ft.<sup>33, 34</sup> The oil may be applied with a cloth mop, a rubber squeegee, or brushed on with a hair broom. Such floors maintain their dust-holding properties for as long as 8 months, provided they are cleaned only with hot water without soap or alkali.<sup>33</sup>

The oiling of hardwood, varnished, or linoleum-covered floors requires more care. Just sufficient oil (one gallon per 1,000 sq. ft.) should be employed to leave a dust-holding surface but one which is not slippery and hazardous to the room occupants.<sup>25</sup> Such thinly coated floors, of course, will require repeated applications of oil to maintain their dust-holding efficiency. Oil may be applied to floors directly with a cloth, mop, or in the form of a sweeping compound—2 gallons of oil mixed with 100 lbs. of sawdust.<sup>28</sup> The only disadvantage to the latter method is that it is difficult to remove all the sawdust from around the legs of desks, tables, beds, and corners of the room. The writer has applied oil successfully to linoleum-covered floors in a hospital ward by daily mopping with 10 per cent oil-in-water emulsion (T-13 formula).<sup>30</sup> In one hospital study a non-oil, dust-retaining compound composed of urea, ninol, and roccal was successfully employed by daily application to the floors.<sup>11</sup> Oiled floors should be cleaned only with warm water, without the use of soap or alkali.

*Application of oil to bedclothes*—Data on oil-in-water emulsions for the application of oil to bedclothes and other fabrics were published in May, 1944, by English workers,<sup>35</sup> and in December, 1944, by the Commission on Air-borne Infections.<sup>28</sup> With the employment of skilled help, both formulae were found to be satisfactory for the

treatment of cotton and woolen textiles with oil. Further experience with these oil-in-water emulsions revealed certain definite disadvantages. The bedclothes treated by the English formula were found to be irritating to the bed occupants,<sup>36</sup> while the woolen blankets treated with the Commission formula developed a rancid odor due to the oxidation of oleic acid, a constituent of the emulsion base.<sup>29</sup>

Further study of the application of oil to fabrics by the Commission on Air-borne Infections<sup>29, 30</sup> resulted in the development of an oil-in-water emulsion known as the "T-13 formula," which contains the following:

<i>Materials</i>	<i>Parts by weight</i>
Mineral oil (Fractol A)	87
Triton NE	13

T-13 oil-emulsion base is milk-white and has the consistency of face cream. When added to water it disperses spontaneously, producing stable oil-in-water emulsions of almost any desired concentration. This formula meets essentially all the requirements of an ideal oil-in-water emulsion for the treatment of cotton and woolen textiles. T-13 oil-emulsion base can be prepared in large amounts and is stable in closed drums for long periods of time (18 months) under varying degrees of temperature. The T-13 oil-emulsion base is applied in the form of dilute emulsions as the final rinse during the routine laundry procedure without alteration in any of the steps in washing and drying of the textiles. The Fire Prevention Section of the National Bureau of Standards has certified that this oil treatment process involves no fire hazard if certain precautions are followed in drying the textiles.<sup>37</sup> The cost of treatment of textiles with the T-13 oil-emulsion base is not prohibitive, being approximately 1½ cents per lb. of woolsens and ⅔ cent for cotton fabrics for the initial treat-

ment, and for subsequent treatments 1/10 cent and 1/3 cent respectively. There is evidence that woolen blankets may not require a subsequent treatment, as little or no oil is removed by washing with soaps and alkalis. The oil, however, is readily removed by the dry cleaning process.<sup>30</sup>

Cotton and woolen fabrics treated with the T-13 oil-emulsion base and containing from 2 to 5 per cent oil are essentially indistinguishable from untreated material in appearance, texture, touch, and odor. Over 200 skin tests with the T-13 oil-emulsion base and extensive use of oiled blankets and sheets treated with this formula by a large number of army personnel over a long period of time have shown that it does not produce skin irritation. Treated blankets containing from 2 to 5 per cent oil by weight possess marked bacteria-holding properties for several months without retreatment. Periodic sampling of oiled and unoiled blankets in army barracks for hemolytic streptococci revealed 75 per cent less positive cultures and 95 per cent fewer organisms per culture from the oiled blankets than were obtained from unoiled controls.<sup>30, 33</sup>

*Effect of oiling floors and bedclothes on the bacterial content of the air in barracks and hospital wards*—In army barracks during the periods of maximum activity when the men were getting up, dressing, sweeping, making beds, etc., oiling floors alone reduced by approximately 70 per cent the number of air-borne bacteria compared to the number recovered from the air in the control barracks.<sup>28, 33</sup> Even though the total bacterial count in the air is greatly reduced in barracks by oiling floors alone, large numbers of hemolytic streptococci may be dispersed into the air from the unoiled bedding.<sup>33</sup> Oiled bedding plus oiled floors effected a further reduction to about 90 per cent of the bacterial counts in the control barrack. There was a similar percentage reduction in

the numbers of hemolytic streptococci in the air of the test compared to the air in the control barracks.<sup>33</sup> In an army hospital ward, oiled floors and bedding reduced the numbers of beta-hemolytic streptococci by 86 per cent compared to the numbers obtained during periods when these dust-suppressive measures were not employed.<sup>11</sup> In a study on the control of streptococcal infection on a measles ward, oiling floors alone was not sufficient to prevent large numbers of type-specific streptococci from spreading about the wards. Oiling of floors, bedclothes, garments, and other articles used on the test ward, however, effected a 90 per cent reduction in the bacterial counts in the air compared to the control ward.<sup>38</sup>

*Oiling floors and bedclothes as a means of controlling respiratory tract infections*—An investigation was carried out in an army camp in England from December, 1942, through March, 1943, on the control of respiratory tract infections by the use of oiled floors only. The average weekly infection rate per 1,000 in the test unit was 7 compared to 38 for the control. An outbreak of acute respiratory disease of epidemic proportions occurred in the control unit with no increase in the rate of infection in the test unit.<sup>39</sup>

Similar studies were done by the Commission on Air-borne Infections at Camp Carson, Colorado, from March to June, 1944.<sup>34</sup> Oiled floors alone, as well as oiled floors and oiled bedclothes, were tested. Group A, comprising approximately 3,800 men in each of the test and control units, was used to observe the effect of oiled floors alone on the incidence of respiratory disease in men living in barracks. The weekly hospital admission rate per 1,000 was 4.0 for the test unit, and 5.9 for the control unit. These rates were too low to evaluate the use of oiled floors alone as a means of controlling respiratory disease.

Groups B and C were employed to evaluate the use of oiled floors plus oiled bedding. In Group B there were approximately 1,600 men each in the test and control units, and the average weekly admission rate per 1,000 for respiratory disease was respectively 6.2 and 11.5. Group C was an organization composed essentially of new recruits with approximately 350 men each in the test and control units. The average weekly admission rate per 1,000 for respiratory disease was 13.3 from the test, and 28 from the control unit. In Groups B and C, approximately 50 per cent of the hospital admissions for respiratory disease from the test and control units had throats positive for hemolytic streptococci. The number of cases and the difference in rates of admissions from the oiled barracks compared to the control were sufficiently great to conclude that oiled floors and bedding effected a significant reduction in the number of admissions for respiratory disease.<sup>34</sup>

A more detailed study on the control of respiratory disease in new recruits, employing oil to floors and bedclothes, was carried out jointly by the Commission on Acute Respiratory Diseases and the Commission on Air-borne Infections at Fort Bragg, North Carolina, from October, 1944, to May, 1945.<sup>40</sup>

During the first period of low endemic occurrence of respiratory disease there was suggestive evidence that the procedure reduced the incidence of hospitalized illness. There was little or no effect during the epidemic occurrence on acute undifferentiated respiratory disease. Hemolytic streptococcal infections and respiratory diseases of known etiology did not occur with sufficient frequency for the effect of the oiling procedures to be evaluated. The difference in the results obtained at Camp Carson compared to those at Fort Bragg may have been due to the high incidence

of streptococcal disease at the former camp.<sup>40</sup>

Only one hospital study has been reported which has attempted to evaluate the use of dust-suppressive measures for the control of streptococcal infections. This was carried out by the English<sup>38</sup> on measles wards during the fall and winter of 1943. A preliminary 3 week period of employing oiled floors alone showed no reduction in the incidence of cross-infections on the test compared to the control ward. During the following 9 weeks, however, when dust-suppressive measures were applied to the floors, bedclothes, garments and all other cotton and woolen fabrics, a marked reduction in streptococcal infections on the test ward occurred. Group A type 6 streptococci were employed as the index of contamination of the wards and of cross-infections. During the 9 week period of study the cross-infection rate was 18.6 per cent on the test ward, and 73.3 per cent on the control, while the complication rate was only 2.8 per cent on the test ward, compared to 14.3 per cent on the control.<sup>38</sup>

#### DISCUSSION AND SUMMARY

Little is known concerning the relative importance of dust, droplets, or droplet nuclei in the spread of disease of bacterial and virus etiology. Dust in hospital wards and army barracks has been shown, however, to become highly contaminated with certain pathogens associated with diseases of the respiratory tract, particularly streptococcal infections. The dispersion of these microorganisms into the air from floors, bedclothes, and clothes of the room occupants at the time of floor sweeping, bedmaking, and dressing, results in a general contamination of the whole ward environment, providing many opportunities for the spread of disease from direct or indirect contact with the infected dust. Little is known concerning the rôle of dust in the trans-

mission of virus diseases or other diseases of the respiratory tract of bacterial etiology.

Oiling floors, bedclothes, and other textiles is a highly effective procedure for the control of dust, lint, and dust-borne bacteria. The action of the oil is a mechanical one only. Methods are now available for the treatment of surfaces and fabrics with oil which fall within the range of practicability with respect to simplicity of application and cost. Although the most important "environmental reservoirs" of pathogens found in hospital wards are the floors and bedclothes, all surfaces (floors, tables, desk tops, etc.), as well as all textiles (blankets, sheets, pajamas, clothes of attending nurses, doctors, etc.), should be oiled to bring about the maximum dust control. The rational use of these dust-suppressive measures for the control of infections will depend on what proportion is dust-borne. Many more studies need to be carried out employing other diseases than those listed above as indices of control before oiling procedures can be accurately evaluated in relation to other methods of disinfection of air.

Studies thus far indicate that oiling floors, bedclothes and other textiles can effect a significant reduction in the incidence of respiratory tract infections of streptococcal etiology in hospital wards and army barracks. The potential hazard of dust as the vehicle for the spread of organisms found in secondarily infected wounds and burns has been emphasized by the British,<sup>15, 20</sup> and dust-control measures are recommended for wards housing patients with these illnesses. No information is available as to the effectiveness of dust-control measures in preventing infection in sanatoria, industries, schools, and the home.

The magnitude of the problem of the control of air- and dust-borne diseases has been emphasized recently by

Mudd.<sup>41</sup> The employment of these dust-laying procedures in conjunction with other methods of air disinfection, such as glycol vapors, ultra-violet light, and adequate ventilation, offers the best opportunity for their control.

CLAYTON G. LOOSLI,\* *Referee*

---

\* Member, Commission on Air-Borne Infections, Army Epidemiological Board, Office of The Surgeon General, U. S. Army; Department of Medicine, University of Chicago.

#### REFERENCES

1. Hare, R. The Expulsion of Hemolytic Streptococci by Nasopharyngeal Carriers. *Canad. Pub. Health J.*, 31:539, 1940.
2. Hare, R. Haemolytic Streptococci in Normal People and Carriers. *Lancet*, 1:85, 1941.
3. Hamburger, M., Jr., Green, M. J., and Hamburger, V. G. The Problem of the "Dangerous Carrier" of Hemolytic Streptococci. I. Number of Hemolytic Streptococci Expelled by Carriers with Positive and Negative Nose Cultures. *J. Infect. Dis.*, 77:68, 1945.
4. Medical Research Council. *War Memorandum No. 11. The Control of Cross Infection in Hospitals*, 1944.
5. Thomas, J. C. Infection from Dust. *Lancet*, I:433, 1941.
6. Hart, D. Rôle of the Respiratory Tract in Contamination of Air: A Comparative Study. *Arch. Surg.*, 38:788, 1939.
7. Finland, M. The Spread of Pneumococcal and Streptococcal Infections in Hospital Wards and in Families. *Aerobiology*, Am. Assoc. Adv. Sci., 17:212, 1942.
8. Crosbie, W. E., and Wright, H. D. Diphtheria Bacilli in Floor Dust. *Lancet*, 1:656, 1941.
9. Neufeld, F. The Significance of Cough Droplets and Dry Dust in the Spread of Tuberculosis. *Am. Rev. Tuberc.*, 15:609, 1927.
10. Loosli, C. G., Appel, E., Robertson, O. H., and Lemon, H. M. The Influence of Temperature and Humidity on the Survival of Influenza A Virus in the Air and Dust. To be published.
11. Puck, T. T., Hamburger, M., Jr., Robertson, O. H., and Hurst, V. The Effect of Triethylene Glycol Vapor on Air-borne Beta Hemolytic Streptococci in Hospital Wards. II. The Combined Action of Glycol Vapor and Dust Control Measures. *J. Infect. Dis.*, 76:216, 1945.
12. Loosli, C. G., Lemon, H. M., Wise, H., and Robertson, O. H. The Transmission and Control of Respiratory Diseases in Army Barracks. I. Contamination of the Environment with Beta-Hemolytic Streptococci. To be published.
13. Lemon, H. M., Loosli, C. G., and Hamburger, M., Jr. The Transmission and Control of Respiratory Diseases in Army Barracks. II. The Air-borne Spread of Hemolytic Streptococcal Infections Among the Enlisted Personnel. To be published.
14. Wells, W. F., Winslow, C.-E. A., and Robertson, E. C. Bacteriologic Procedures in the Evaluation of Methods for Control of Air-borne Infection. *A.J.P.H.*, 36:324, 1946.

15. Medical Research Council. *War Memorandum No. 6. The Prevention of "Hospital Infection" of Wounds.* 1942.
16. van den Ende, M., Harries, E. H. R., Stuart-Harris, C. H., Stergman, A. J., and Cruickshank, R. Laboratory Infection with Murine Typhus. *Lancet*, 1:328, 1943.
17. Hornibrook, J. W., and Nelson, K. R. An Institutional Outbreak of Pneumonitis. II. Epidemiological and Clinical Studies. *Pub. Health Rep.*, 55: 1936, 1940.
18. White, E. On the Possible Transmission of Hemolytic Streptococci by Dust. *Lancet*, 1:941, 1936.
19. Brown, W. A., and Allison, V. D. Infection of Air of Scarlet-Fever Wards with Streptococcus Pyogenes. *J. Hyg.*, 37:1, 1937.
20. Hare, R. The Prevention of Streptococcal Infection of Wounds. *Canad. Pub. Health J.*, 31:407, 1940.
21. Hamburger, M., Jr., Puck, T. T., Hamburger, V. G., and Johnson, M. A. Studies on the Transmission of Hemolytic Streptococcus Infections. III. Hemolytic Streptococci in the Air, Floor Dust, and Bedclothing of Hospital Wards and Their Relation to Cross Infection. *J. Infect. Dis.*, 75:79, 1944.
22. Hollaender, A., du Buy, H. G., Ingraham, H. S., and Wheeler, S. M. Control of Air-borne Microorganisms by Ultra-violet Floor Irradiation. *Science*, 99:130, 1944.
23. Puck, T. T., Robertson, O. H., and Lemon, H. M. Bactericidal Action of Propylene Glycol Vapour on Microorganisms Suspended in Air; Influence of Various Factors on Activity of Vapor. *J. Exper. Med.*, 78:387, 1943.
24. Pulvertaft, R. J. V. The Use of Antiseptic Sprays for Air Sterilization. *J. Hyg.*, 43:352, 1944.
25. Thomas, J. C. Reduction of Dust-borne Bacteria by Oiling Floors. *Lancet*, 2:123, 1941.
26. van den Ende, M., Edward, D. G. ff., and Lush, D. Reduction of Dust-borne Infection by Treatment of Bedclothes. *Lancet*, 1:716, 1941.
27. van den Ende, M., and Thomas, J. C. Treatment of Bedclothes with Dust-laying Oils; Use of Oil-in-Water Emulsions. *Lancet*, 2:755, 1941.
28. Robertson, O. H., Hamburger, M., Jr., Loosli, C. G., Puck, T. T., Lemon, H. M., and Wise, H. M. A Study of the Nature and Control of Air-borne Infection in Army Camps. *JAMA*, 126:993, 1944.
29. Puck, T. T., Robertson, O. H., Wise, H., Loosli, C. G., and Lemon, H. M. The Oil Treatment of Bedclothes for the Control of Dust-borne Infection. I. Principles Underlying the Development and Use of a Satisfactory Oil-in-Water Emulsion. *Am. J. Hyg.*, 43:91, 1946.
30. Loosli, C. G., Wise, H., Lemon, H. M., Puck, T. T., and Robertson, O. H. The Oil Treatment of Bedclothes for the Control of Dust-borne Infection. II. The Use of Triton Oil Emulsion (T-13) as a Routine Laundry Procedure. *Am. J. Hyg.*, 43:105, 1946.
31. Loosli, C. G., and Robertson, O. H. Recent Studies on the Control of Dust-borne Bacteria by Treatment of Floors and Bedclothes with Oil. *Am. J. M. Sc.*, 209:166, 1945.
32. Federal Specification for Oil, Floor; Mineral. *Federal Standard Stock Catalog*, Sec. IV (Part 5), P-O-361, July 5, 1938.
33. Lemon, H. M., Loosli, C. G., and Wise, H. The Transmission and Control of Respiratory Diseases in Army Barracks. III. The Control of Dust borne Bacteria by Oiling Floors and Bedclothes. To be published.
34. Loosli, C. G., Lemon, H. M., Robertson, O. H., Hamburger, M., Jr., and Puck, T. T. The Transmission and Control of Respiratory Diseases in Army Barracks. IV. The Control of Respiratory Tract Infections by Oiling Floors and Bedclothes. To be published.
35. Harwood, F. C., Powney, J., and Edwards, C. W. A New Technique for the Application of Dust-laying Oils to Hospital Bed-clothes. *Brit. M. J.*, 1:615, 1944.
36. Cruickshank, R. Personal Communication.
37. National Bureau of Standards. Report on Tests to Determine Susceptibility to Spontaneous Heating of Oiled Bedding and the Use of Triton as the Emulsifying Agent. Test No. T. G. 3624-268: *F. R.* 2349, Mar. 16, 1945.
38. Wright, J., Cruickshank, R., and Gunn W. The Control of Dust-borne Streptococcal Infection in Measles Wards. *Brit. M. J.*, 1:611, 1944.
39. Anderson, P. H. R., Buchanan, J. A., and MacPartland, J. J. Oiled Floors to Control Respiratory Infection. *Brit. M. J.*, 1:616, 1944.
40. The Commission on Acute Respiratory Diseases and The Commission on Air-borne Infections. A Study of the Effect of Oiled Floors and Bedding on the Incidence of Respiratory Disease in New Recruits. *Am. J. Hyg.*, 43:120, 1946.
41. Mudd S., Air-borne Infection. The Rationale and Means of Disinfection of Air. *Bull. New York Acad. Med.*, 21:393, 1945.

## Radio in Public Health

A meeting under the Chairmanship of Dr. Iago Galdston of the New York Academy of Medicine, devoted to the subject of Radio in Public Health, will be held as one of the features of the Institute for Education by Radio, at 8 o'clock on Saturday evening, May 3, at Columbus, Ohio.

At this meeting the fundamental subjects—what public health can achieve through radio, and how it can do this most effectively, will be dealt with.

Public health workers, directly and indirectly concerned with radio, are invited to attend and to participate in this Conference.

# Problems and Errors in Assigning Causes of Bacterial Food Poisoning

G. M. DACK, PH.D., M.D.

*Department of Bacteriology and Parasitology, and Director of the Food Research Institute, University of Chicago, Chicago, Ill.*

CERTAIN bacterial agents have been implicated in outbreaks of food poisoning on the basis of presumptive and inconclusive evidence.<sup>1</sup> Year after year some of these same agents are reported in the literature without additional proof as to their etiological significance. As a result many misconceptions have arisen in textbooks and scientific journals regarding the rôle of such agents in food poisoning. It is the purpose of this paper to point out some of the problems in this field and to illustrate with a few examples some of the difficulties in assigning significance to these organisms.

Many kinds of microörganisms have been alleged to cause food poisoning merely because they have been found in large numbers in implicated foods, or in the vomitus or stools of patients. Some of these bacteria are natural inhabitants of the intestinal tract of healthy persons and there is no reason other than the circumstantial evidence cited for assigning them causative rôles in food poisoning. Most food at the time of eating contains many kinds of viable bacteria and certain foods may contain millions of bacteria per gram without causing illness. In the latter circumstances it should not be surprising to find the kind of organisms which are isolated from heavily contaminated food also appearing in specimens of vomitus and feces.

When illness follows the eating of a specific item of food there may have

been a lapse of many hours before a sample is collected for laboratory study. Often the food specimen is recovered from a garbage pail where it has been subject to contamination from other decaying foods and has been held at a temperature for a sufficient time to change the bacterial population from that present at the time of eating.

Another error is the failure to exclude known food poisoning bacteria or their products as the cause of illness. For example, staphylococcus enterotoxin gives rise to well defined symptoms with illness appearing 1 to 5 hours (usually 2½ to 3 hours) after swallowing the enterotoxin. There is frequently marked prostration, and in some cases shock. Vomiting and diarrhea are prominent symptoms and blood and mucus may be present in the discharges. The illness tends to be more severe when the incubation period is short. When a large number of persons presenting these symptoms is observed, it is important to rule out staphylococcus food poisoning before implicating another organism. Staphylococcus enterotoxin withstands boiling temperatures and for this reason it is possible to have enterotoxin present in a food after the organisms have been killed.

Many bacteria other than staphylococci have been assigned as causative agents in food poisoning outbreaks that were undoubtedly caused by staphylococcus enterotoxin. Although it is possible that other agents may simu-

late staphylococcus food poisoning, there has never been a clearly proven example of such an exception.

Aside from botulism and staphylococcus food poisoning which are caused by toxins preformed in food, other outbreaks of food poisoning follow the ingestion of living organisms. The symptoms and incubation period of the latter group, which include the salmonella and certain alpha-type streptococci,<sup>2-4</sup> may not readily be distinguished or the condition diagnosed except by finding the specific agents and excluding other types of food poisoning. Too often only media selective for the Gram-negative intestinal bacteria have been used for the examination of specimens without concurrent use of media that support growth of the alpha-type streptococcus.

Recently several species of microorganisms such as paracolon bacilli,<sup>5</sup> *Salmonella pullorum*,<sup>6</sup> *Proteus mirabilis*,<sup>7</sup> *Clostridium perfringens*,<sup>8</sup> and hemolytic streptococci<sup>9</sup> have been implicated as possible causative agents of food poisoning. All of these microorganisms when grown in suitable media produce substances which are toxic for animals by the parenteral route. This property of culture filtrates of various microorganisms to produce diarrhea and vomiting in animals by the parenteral route has frequently given rise to difficulty in the identification of enterotoxic material. In distinction to the above, a true enterotoxin is toxic when fed in adequate amounts to suitable animals. They may also be toxic by the parenteral route.

Since many of the above microorganisms have been implicated from time to time over a period of years, it is imperative that their rôle in the etiology of food poisoning be established. A positive solution to the problem would involve the feeding of cultures and filtrates to human volunteers. Obviously this procedure is not to be

recommended, since in the case of many members of the group of Gram-negative intestinal bacteria, their pathogenicity is unknown. Furthermore, in food poisoning outbreaks caused by certain well established salmonella species (e.g., *S. enteritidis*, *S. cholerae suis*), an occasional person may develop a systemic infection. Although there is little evidence that other species of salmonella isolated in association with food poisoning produce systemic infection, the possibility of such infections is sufficient reason for condemning such an approach to the problem.

In the absence of a direct approach involving the feeding of living agents to human volunteers, proof of the etiologic significance of an agent in food poisoning outbreaks rests upon a number of observations and tests. A careful epidemiological study is valuable, especially in outbreaks in which a single item of food may be established as a common denominator for all who were made ill. This becomes difficult in the presence of a prolonged incubation period. If an implicated item of food can be secured, it is important to know what has happened to it and whether or not it has been kept under refrigeration or has been heated since the time of the outbreak. If, by good fortune, the food has been refrigerated, then a quantitative study of the bacteriological flora should be made, including a search for all probable food poisoning agents. A search should be made for agents in the stools and vomitus of patients, and blood cultures may be desirable in infections resembling those caused by salmonella.

In the case of food poisoning agents such as salmonella, which are associated with infection rather than intoxication, there may be some valuable information collected with reference to the development of agglutinins or other immune bodies in patients recovering from attacks of the disease. The interpretation



of low agglutinin titers is unsatisfactory. In all cases where the agglutination test is employed the limitations of the test should be borne in mind, and the possibility of previous exposures or immunizations should be considered. It is well known that in mild attacks of gastrointestinal illness caused by salmonella, slight or no rise in agglutinin titers may be found in the sera of patients during convalescence.

The evaluation of the significance of a bacterium as an etiological agent in food poisoning is complicated when the organism is frequently found in the

normal intestinal tract or is a widespread saprophyte. For example, *Proteus*<sup>10</sup> is constantly present in rotten meat, sewage, garden soil, and vegetables. This organism also is often found in human and animal feces. The numbers may be, but usually are not, markedly increased when the intestinal function is impaired. Another example is found in the case of *Clostridium welchii*,<sup>11</sup> which is present in soil, water, milk, dust, sewage, and the intestinal canal of man and animals. As a matter of fact, *Clostridium welchii* has been shown to be present in the commercial

TABLE 1

*Some Outbreaks of Food Poisoning with Questionable Causative Agents*

<i>Implicated Agent</i>	<i>Food Involved</i>	<i>No. Cases and Symptoms</i>	<i>Remarks</i>
Paracolon Organisms <sup>5</sup>	Corn pudding	52 cases. Incubation period averaged 12 hours. Diarrhea 92.3%; abdominal cramps 75%; nausea 50%; vomiting 11.5%; recovery complete in 12 hours.	No food samples were available for examination. Stool and rectal swab specimens from 17 of 52 patients. All specimens plated on SS agar and modified tetrathionate enrichment medium: 28 single colonies of paracolon organisms isolated from 12 of 17 patients. No tests were made for alpha-type streptococci.
Cloacae-Aerogenes Group <sup>14</sup>	Cream-filled pastry	125 cases on 2 successive days. Symptoms in every case within a few hours after eating either cream puffs or chocolate eclairs. Symptoms characterized by violent and prolonged nausea and vomiting, followed by profuse diarrhea. No rise in temperature noted. Symptoms subsided in 4-10 hours.	<i>Staphylococci</i> were found in large numbers in the filling but excluded as cause of food poisoning because of negative animal tests for enterotoxin although the symptoms are those of <i>staphylococcus</i> food poisoning. Cloacae-Aerogenes group isolated from 5 fecal specimens and from filling of 5 cream puffs or eclairs.
<i>Salmonella pullorum</i> <sup>6</sup>	Rice pudding	423 cases with 172 hospitalized with symptoms of fever (av.: 102° F.), diarrhea, headache, abdominal cramps, chills, nausea, vomiting, general myalgia, prostration and backache. All patients recovered by end of 3rd day of hospitalization. No data given as to time elapsing between eating of rice pudding and onset of illness.	No food item was available for bacteriological examination. <i>Salmonella pullorum</i> was isolated in 11.7% of hospital patients and <i>Salmonella derby</i> from 0.6%. Investigation made after peak of epidemic and during convalescence of patients. No report is made of a search for other agents.
<i>Proteus vulgaris</i> <sup>15 *</sup>	Meat	209 persons affected with abdominal pain, vomiting and diarrhea coming on 12-18 hours after meal. Fever generally absent.	Isolated <i>Proteus</i> from meat specimen and from stools. Agglutinins in serum of 36 of 54 patients' serum tested in titer varying from 1-50 to 1-200 dilution. Titers in normal human serum are not included. No report is made of a search for alpha-type streptococci.

TABLE 1 (Cont.)

*Some Outbreaks of Food Poisoning with Questionable Causative Agents*

<i>Implicated Agent</i>	<i>Food Involved</i>	<i>No. Cases and Symptoms</i>	<i>Remarks</i>
<i>Proteus</i> <sup>10 *</sup>	Sausage	2,000 soldiers attacked with illness characterized by vomiting, diarrhea, and exhaustion. Symptoms appeared in most cases in 2-3 hours after eating sausage. Low grade fever only in severe cases which promptly subsided following treatment; 200 men hospitalized. Those who did not eat sausage were not ill nor were those who ate from the same shipment of sausage two days earlier.	Bacteriological examination of sausage revealed <i>cocci</i> and <i>Proteus vulgaris</i> . No salmonella found. Symptoms are those of staphylococcus food poisoning.
<i>Proteus mirabilis</i> <sup>7</sup>	Sliced baked ham	29 cases reported and 19 hospitalized. Symptoms of severe nausea and vomiting and diarrhea. Onset of symptoms averaged 3 hours after eating. Of 19 hospitalized patients 3 passed blood; 16 had abdominal cramps; 3 had fever with a maximum of 101° F.; 16 had normal or subnormal temperatures.	<i>Proteus mirabilis</i> isolated from suspected ham and from 9 of 19 patients studied. Ham tested bacteriologically contained 62,000 organisms per gram and of this number 12,000 per gram were staphylococci. Staphylococcus food poisoning excluded because of low count. There is no record as to whether ham had been heated thus possibly destroying living organisms but not enterotoxin. Symptoms typical of staphylococcus food poisoning.
<i>Clostridium welchii</i> <sup>13</sup>	Milk	Illness in babies and children characterized by fluid stools with offensive odor and by fever. Abdomen was acutely distended by gas in intestinal tract. Pus in stools.	Milk grossly contaminated with spores of <i>Clostridium welchii</i> . When non-contaminated acid milk was fed, diarrhea and abdominal distention promptly subsided and stools became normal. Symptoms suggest active fermentation process in intestinal tract with mechanical distention of the bowel giving rise to nausea and hyperperistalsis. No intoxication need be postulated.
<i>Clostridium welchii</i> <sup>8</sup>	Creamed chicken croquettes from pre-cooked chicken	At least 20 people involved in 3 outbreaks. Nausea, vomiting (rare), intestinal cramps and diarrhea beginning 8-12 hours after the meal and continuing for 12 hours. Illness mentioned in one human volunteer.	Author suggests that <i>Clostridium welchii</i> may at times produce potent enterotoxin for man. (No intoxication need be postulated.) See above outbreak. <sup>13</sup>
Hemolytic Streptococci <sup>17</sup>	Ground ham sandwiches	Of 102 persons ill, 24 had scarlet fever; 56 sore throats; 7 diarrhea; 4 vomiting; 3 nausea; and 8 miscellaneous complaints.	Kittens developed vomiting and diarrhea following intravenous injection with material extracted from streptococcus ground meat cultures. When the same material was fed kittens, they remained well. Parenteral intoxication. No evidence of enteric intoxication.

\* Note that these outbreaks were reported before the rôle of staphylococcus in food poisoning was fully established.

"bread starter" for salt-rising bread<sup>12</sup> as well as in the baked loaves. It is possible that *Clostridium welchii* in large numbers in certain foods may ferment these foods after ingestion and the gases formed cause distention of the bowel with accompanying nausea, abdominal cramping, and diarrhea. The dramatic and almost immediate response to a change in diet<sup>13</sup> would suggest that no intoxication is present.

A few outbreaks which have been described in the literature are tabulated in order to illustrate some of the problems concerned with assigning bacterial agents as causes of food poisoning (see Table 1). The author is fully aware that conditions are not always ideal for definitely incriminating an organism as a causative agent. Although it is important to maintain a vigilant search for new agents, caution should be exercised in multiplying the number of agents on the basis of presumptive but inconclusive evidence.

## REFERENCES

1. Dack, G. M. *Food Poisoning*. University of Chicago Press. 1943. pp. 124-127.
2. *Ibid.* pp. 119-123.
3. Sherman, J. M., Smiley, K. L., and Niven, C. F., Jr. The Identity of a Streptococcus Associated with Food Poisoning from Cheese. *J. Dairy Sci.*, 26:321-323, 1943.
4. Osler, A. G., Dillon, E., and Buchbinder, L. Bacteriological Study of Canned Evaporated Milk Implicated in an Outbreak of Gastroenteritis. Abstract. *J. Bact.*, 49, 4:413-414, 1945.
5. Barnes, L. A., and Cherry, W. B. A Group of Paracolon Organisms Having Apparent Pathogenicity. *A.J.P.H.*, 36:481-483, 1946.
6. Mitchell, R. B., Garlock, Fred C., and Broh-Kahn, R. H. Outbreak of Gastroenteritis—*Salmonella pullorum*. Abstract. *Bull. U. S. Army Med. Dept.* (Mar.), 1946, pp. 248-250.
7. Cherry, W. B., Lentz, P. L., and Barnes, L. A. Implication of *Proteus mirabilis* in an Outbreak of Gastroenteritis. *A.J.P.H.*, 36:484-488, 1946.
8. McClung, L. S. Human Food Poisoning Due to Growth of *Clostridium perfringens* (*C. welchii*) in an Outbreak of Gastroenteritis. *A.J.P.H.*, 36:484-488, 1946.
9. Getting, V. A., Wheeler, S. M., and Foley, George E. A Food-borne Streptococcus Outbreak. *A.J.P.H.*, 33:1217-1223, 1943.
10. Topley, W. W. C., and Wilson, G. S. *The Principles of Bacteriology and Immunity*. William Wood and Co., 1937, p. 504.
11. *Ibid.* p. 604.
12. Koser, Stewart A. *Bacillus welchii* in Bread. *J. Infect. Dis.*, 32:208-219, 1923.
13. Nelson, Casper I. Flatulent Diarrhea Due to *Clostridium welchii*. *J. Infect. Dis.*, 52:89-93, 1933.
14. Gilbert, Ruth, Coleman, Marion B., and Laviano, Alice B. Food Poisoning Due to Toxic Substances Formed by Strains of the Cloacae-Aerogenes Group. *A.J.P.H.*, 22:721-726, 1932.
15. Wichels, Paul, and Barner, Wiegand. - Über eine Lebensmittelvergiftung durch den Bacillus *Proteus vulgaris*. *Med. Klin.*, 21:1880-1882, 1925.
16. Baerthlein, Karl. Ueber ausgedehnte Wurstvergiftungen, bedingt durch Bacillus proteus vulgaris München. *med. Wchnschr.*, 69:155, 1922.
17. Foley, G. E., Wheeler, S. M., and Getting, V. A. Food-borne Streptococcus Poisoning and Infection. *Am. J. Hyg.*, 38:250-259, 1943.

# Inactivation of the Virus of Infectious Hepatitis in Drinking Water\*

JOHN R. NEEFE, M.D., MAJOR JAMES B. BATY, SN.C., A.U.S.,  
JOHN G. REINHOLD, PH.D., AND JOSEPH STOKES, JR., M.D.

*National Research Council Senior Fellow in the Medical Sciences and Instructor in Medicine, University of Pennsylvania; Chief, Sanitary Engineering Branch, Preventive Medicine Service, Office of the Surgeon General, A.U.S.; Principal Biochemist, Philadelphia General Hospital; Professor of Pediatrics, University of Pennsylvania*

IN previous reports, the transmission of a virus of infectious (epidemic) hepatitis by drinking water to most of the residents of a summer camp for boys and girls<sup>1</sup> and the results of preliminary experiments on the disinfection of water containing this virus were described.<sup>2</sup> Although the epidemiological and experimental data afforded adequate evidence that the virus responsible for the summer camp epidemic was water-borne, circumstances prevented an adequate investigation of the suspected source (a cess pool) of contamination of the water supply (a deep well) at the time of the epidemic. Subsequently, a careful sanitary investigation of the relationship of the cess pool to the well provided evidence, described elsewhere,<sup>3</sup> that the water supply could have been contaminated with sewage material from the cess pool suspected at the time of the epidemic. This finding thus fur-

ther strengthened the previous conclusions<sup>1</sup> based on other epidemiological and experimental observations.

The "hepatitis viruses" pass through filters which retain bacteria,<sup>1,4</sup> and they have survived heating at 56° C. for at least ½ hour,<sup>4</sup> have remained active for several years in materials kept in the frozen state<sup>5</sup> or in the liquid state at 4° C.,<sup>6</sup> and one in desiccated yellow fever vaccine was found to be active after storage for at least 1 year at room temperature.<sup>7</sup> "Hepatitis viruses" in plasma or serum have remained active in the presence of merthiolate in a concentration of 1 to 2,000<sup>8</sup> and in the presence of a mixture of equal parts of phenol and ether added to a concentration of 0.5 per cent.<sup>9</sup> The available evidence concerning the properties of these viruses thus indicates that they are resistant to certain procedures which eliminate or destroy bacteria and suggests that certain methods of water disinfection known to be adequate for bacterial intestinal pathogens may not be adequate for the more resistant viruses.

Preliminary studies<sup>2</sup> have shown that treatment of heavily contaminated

\* From the Departments of Pediatrics and Medicine of the School of Medicine and Hospital of the University of Pennsylvania.

This investigation was conducted under the Commission on Measles and Mumps, Army Epidemiological Board, with the assistance of the Sanitary Engineering Division, both of the Preventive Medicine Service, Office of the Surgeon General, War Department, Washington, D. C.

water with sufficient chlorine to produce a total chlorine residual of 1 p.p.m. after 30 minutes' contact (Lyster bag technique used for emergency disinfection of drinking water in the field) did not inactivate or attenuate a virus of infectious (epidemic) hepatitis that had been added to the water (water specimen 2, Table 2). Treatment of similarly contaminated water by the "breakpoint" chlorination technique (followed by dechlorination) apparently did inactivate this virus,<sup>2</sup> as none of the 5 volunteers ingesting such treated water developed clinical manifestations of the disease (water specimen 5, Table 2). Four of the 5 men, however, developed positive cephalin cholesterol flocculation tests between the 42nd and 67th days after ingestion of this water. Subsequently, the 5 men were inoculated with the untreated active virus and 4 of the 5 developed typical acute infectious hepatitis after incubation periods of 3 to 4 weeks. As other studies have indicated that inapparent infections unaccompanied by any laboratory evidence of hepatic disturbance may be followed by resistance to reinfection with the same virus,<sup>5</sup> there is some doubt as to whether the positive cephalin cholesterol flocculation tests following the ingestion of the treated water were due to inapparent hepatitis. Because the interpretation of the positive cephalin cholesterol flocculation tests is not clear, however, and as they apparently were not technical in origin, the results indicate that "breakpoint chlorination" of this heavily contaminated water either completely inactivated the hepatitis virus or at least inactivated it to the extent that it was not able to induce clinically apparent hepatitis or resistance to reinfection.

Finally it was found<sup>2</sup> that treatment of contaminated water with sodium carbonate, aluminum sulfate, and activated carbon did not completely remove

or inactivate the hepatitis virus although some decrease in the concentration of the virus and possibly some decrease in its virulence apparently resulted (water specimen 4, Table 2).

As these initial studies suggested that the hepatitis viruses might be more resistant to chlorine than the pathogenic bacteria commonly encountered in water, and the present methods of water disinfection are based on their effectiveness in controlling the bacterial pathogens, further studies of their effect on the hepatitis virus appeared desirable. The present report deals with the results of additional studies on this problem, particularly with those obtained with different dosages of chlorine applied after preliminary coagulation and filtration.

#### MATERIALS AND METHODS

*Preparation of Contaminated Water Specimens (Raw Specimens)*—The method of preparation of the raw specimens was the same as that used in the previous experiments.<sup>2</sup> Briefly, specimens of distilled water were contaminated with the virus of infectious (epidemic) hepatitis described in previous reports<sup>1, 2, 5</sup> by adding to each a similar quantity (varying from 40 to 50 parts of feces per million parts of water in the different experiments) of a feces suspension known to contain that virus. Approximately 2 ml. of a suspension of *Escherichia coli* also were added to each specimen for the purpose of facilitating a study of the effect of the treatment procedures on the bacterial counts. The raw specimens then were allowed to stand for a period of 24 hours at room temperature before further treatment was applied.

*Water Specimen 6 (Control)*—The raw specimen was siphoned off and passed through a pad composed of 4 layers each of sterile cotton and gauze, the object being only to remove any solid particles of feces that remained. This specimen, which was not sub-

jected to further treatment, was used as a control for specimens 7, 8, and 9, the results obtained with specimen 6 indicating those that would have been expected from specimens 7, 8, and 9 prior to treatment.

*Water Specimen 7*—The raw specimen was coagulated by adding 2.0 grains of sodium carbonate per gallon of water and 4.0 grains of aluminum sulfate per gallon of water. After stirring gently for 15 minutes, which resulted in the production of a heavy, promptly settling "floc," the specimen was allowed to stand for one hour without disturbance. During this period, the "floc" settled. The clear, colorless supernatant was siphoned with sterile apparatus through a sterile gauze and cotton pad into a sterile bottle. The water then was filtered through a model diatomite filter (employing a diatomaceous silica filter coat) of the type developed during the war for use by the United States Army in the field and described in detail elsewhere.<sup>3</sup> The filtrate was received in a sterile bottle. A dosage of 3.25 p.p.m. of freshly prepared chlorine solution was applied to the filtered water and after 30 minutes' contact the total chlorine residual (measured by the starch-potassium iodide method, titration with sodium thiosulfate) was found to be 1.17 p.p.m. Using the orthotolidine test (color comparator method), the residual chlorine read approximately 1.0 p.p.m. An orthotolidine arsenite test<sup>10</sup> indicated a residual free chlorine content slightly in excess of 0.4 p.p.m. Forty-two minutes after the chlorine had been added, the specimen was completely dechlorinated with sodium sulfite, this representing the final step in its treatment.

*Water Specimen 8*—Except for the addition of 25 p.p.m. of activated carbon to the raw specimen simultaneously with the sodium carbonate and aluminum sulfate and a different chlorine dosage, specimen 8 was treated exactly as specimen 7. A dosage of 7.5 p.p.m. of chlorine was applied and resulted in a 30 minute total residual chlorine content of 5.2 p.p.m. The specimen was dechlorinated 36 minutes after the chlorine had been added, this completing its treatment.

*Water Specimen 9*—The specimen was treated exactly as specimen 8 except for the dosage of chlorine applied. A dosage of 15 p.p.m. of chlorine was used and the 30 minute total chlorine residual was 11.3 p.p.m. The specimen was dechlorinated 34 minutes after the chlorine had been added, this completing the treatment.

*Water Specimen 10 (Control)*—This differed from the control specimen 6 only in that the quantity of the feces suspension

added to the distilled water in preparing the raw specimen was slightly greater for specimen 10. Raw specimen 10 was strained in the same fashion as specimen 6 and was used without further treatment as a control for specimens 11 and 12.

*Water Specimens 11 and 12*—A raw specimen identical with, but twice the volume of, specimen 10 was coagulated, allowed to settle, and then filtered in the same manner as specimen 7. One-half of the filtrate was removed to a separate sterile bottle. This constituted *specimen 11* which received no additional treatment. The other half (*specimen 12*) then was chlorinated, a dosage of 3.25 p.p.m. being applied. The 30 minute total chlorine residual was 2.0 p.p.m. by the starch potassium iodide method and approximately 1.5 p.p.m. by the orthotolidine test, 0.4 to 0.45 p.p.m. of this being in the form of free chlorine as indicated by the orthotolidine-arsenite test. Specimen 12 was dechlorinated by the end of 36 minutes, this completing the treatment. Specimens 11 and 12 thus both were coagulated, allowed to settle, and the clear supernatant filtered through a diatomite filter. Specimen 12, in addition, was chlorinated.

*Studies on Water Specimens*—Chemical and bacteriological analyses of each of the specimens were conducted by the methods described previously.<sup>2</sup> The studies for the presence of, or the effect of the treatment procedure on, the hepatitis virus were conducted in human volunteers in the same manner and under the same controlled conditions as those described previously.<sup>2</sup> The volunteers all were under 33 years of age and had no previous history of jaundice, no previous experimental inoculations, and no current evidence of hepatic disturbance detectable by history, physical examination, or laboratory tests. Isolation of the volunteers by groups was carried out as in the previous experiments.<sup>2</sup> All needles and syringes used on the volunteers for any purpose in these studies were sterilized by autoclaving for 20 to 30 minutes before each use. Following ingestion of the water specimens, the volunteers were under continuous observation and study for a minimum period of 6 months.

TABLE 1

Water Specimen	pH	Chemical Analyses									Bacteriological Analyses		
		Total Solids		Sus. Solids		Nitrogen					Tests for E. coli		Bacteria per ml. (37° C., 24 hrs.)
		Tot.	Org.	Tot.	Org.	Total	Albumi- noid	Ammo- nia	Nitrite	Nitrate	Pre- sump- tive	Con- firmed	
6 (Control)	6.4	60	38	20	13	0.92	0.65	0.043	0.005	0.02	+	+	1,225,000,000
7	6.8	82	6	3	2	0.33	0.17	0.010	0.001	0.01	—	—	—
8	6.8	86	14	8	4	0.25	0.15	0.009	0.001	0.01	—	—	—
9	6.9	98	9	7	3	0.26	0.18	0.009	nil	0.01	—	—	—
10 (Control)	6.9	45	..	23	22	....	1.44	0.05	0.013	3.0	+	+	8,000,000,000
{ 11	6.7	87	3	0.2	0.2	....	0.38	0.167	0.011	1.9	+	+	173,520,000
{ 12	7.3	119	10	0.2	0.2	....	0.34	0.285	0.003	1.6	—	—	10

Summary of results of chemical and bacteriological studies made on Water Specimens 6 to 12. See Table 2 for data on treatment of these specimens. All chemical results, except pH, are expressed in parts per million. pH measured at 25° C. "Tot.," "Sus.," "Org." represent total, suspended, and organic respectively.

### RESULTS

A detailed presentation of the results of the chemical and bacteriological analyses of the various water specimens is not within the scope of this paper. These results, summarized in Table 1, are considered more fully elsewhere.<sup>3</sup>

Because of the limitations imposed by the number of available volunteers, it was necessary to carry out the present studies in two parts. Water specimens 6, 7, 8, and 9 were prepared simultaneously and ingested by different groups of volunteers (groups VI, VII, VIII, and IX) in August, 1945. Specimens 10, 11, and 12 were prepared simultaneously and ingested by different groups of volunteers (groups X, XI, and XII) in November, 1945. The conduct of the two parts of the experiments at different times required the use of a control group each time (groups VI and X, water specimens 6 and 10 respectively).

The effect of the various treatment procedures on the hepatitis virus, as indicated by comparison of the results in the volunteers after ingestion of the treated and untreated (control) water specimens were as follows (Table 2):

#### Water Specimen 6 (untreated; control)—

Each of the 5 volunteers ingested approximately 2¾ liters of this specimen over a period of 24 hours. Three of the 5 developed typical infectious hepatitis after incubation periods of 23, 24, and 27 days respectively. One other subject developed fever, abdominal pain, anorexia, nausea, and malaise only 8 days after inoculation. Because of the possibility that the unusually early onset, if the symptoms were due to hepatitis, might be indicative of unusual susceptibility resulting in an especially severe attack, he was treated intensively (intravenous plasma, glucose, and methionine) beginning on the first day of his illness. Prompt recovery followed without the development of jaundice or significant laboratory evidence of hepatic disturbance. Excluding this case, in which the diagnosis was uncertain, the incidence of unquestionable hepatitis in this control group thus was at least 60 per cent.

*Water Specimen 7 (coagulated, filtered, 3.25 p.p.m. chlorine dosage)*—None of the 5 volunteers, each of whom ingested approximately 2¾ liters of this specimen, developed clinical or laboratory manifestations of hepatitis or other illness during a 6 month period of observation.

*Water Specimen 8 (coagulated, activated carbon, filtered, 7.5 p.p.m. chlorine dosage)*—None of the 5 volunteers, each of whom ingested approximately 2¾ liters of this specimen, developed clinical or laboratory manifestations of hepatitis or other illness during a 6 month period of observation.

*Water Specimen 9 (coagulated, activated*

TABLE 2  
Treatment of Water Specimens

Specimen	Chlorine (p.p.m.)						Results in Volunteers		
	Coagulated	Act. Carbon	Filtered	Dose	30' Residual		No. Inoc.	Hepatitis	Incubation Period (Days)
					Total	Free			
1 (Control)	—	—	—	—	—	—	5	2	22, 24
2	—	—	—	2.5	1.08	N.D.	5	2	23, 28
3 (Control)	—	—	—	—	—	—	5	4	19, 19, 19, 22
4	+	+	—	—	—	—	5	2	33, 37
5	—	—	—	25	15	N.D.	5	0	—
6 (Control)	—	—	—	—	—	—	5	3	23, 24, 27
7	+	—	+	3.25	1.1	0.4	5	0	—
8	+	+	+	7.5	5.2	N.D.	5	0	—
9	+	+	+	15	11.3	N.D.	5	0	—
10 (Control)	—	—	—	—	—	—	6	5	18, 20, 21, 24, 27
11	+	—	+	—	—	—	7	3	27, 30, 31
12	+	—	+	3.25	2.0	0.4	7	0	—

Effect of various procedures employed in the disinfection of drinking water on a virus of infectious (epidemic) hepatitis as indicated by the incidence of hepatitis in volunteers after ingestion of such treated water. The data on Specimens 1 and 2 and on Specimens 3, 4, and 5 are from two earlier experiments (cf. 2). These data have been included to facilitate comparison with the present results. "Coagulated" refers to the treatment of water with aluminum sulfate and sodium carbonate. "Act. Carbon" indicates the use of activated carbon as an adsorbent. "Filtered" refers to filtration through a model diatomite filter with a diatomaceous silica filter coat; "p.p.m." indicates parts of chlorine per million parts of water. "N.D." represents "not determined." "Hepatitis" refers to the number of volunteers who developed unquestionable infectious hepatitis following ingestion of the various water specimens ("inoc."—inoculation).

carbon, filtered, 25 p.p.m. chlorine dosage)—None of the 5 volunteers, each of whom ingested approximately  $2\frac{3}{4}$  liters of this specimen, developed clinical or laboratory manifestations of hepatitis or other illness during the 6 month period of observation.

Water Specimen 10 (untreated; control)—Of the 6 volunteers who each ingested approximately  $2\frac{3}{4}$  liters of this untreated specimen, 5 developed infectious hepatitis after incubation periods of 18, 20, 21, 24, and 27 days respectively.

Water Specimen 11 (coagulated, filtered, no chlorine)—Of the 7 men who each ingested approximately  $2\frac{3}{4}$  liters of this specimen, 3 developed infectious hepatitis after incubation periods of 27, 30, and 30 days respectively.

Water Specimen 12 (coagulated, filtered, 3.25 p.p.m. chlorine)—None of the 7 volunteers, each of whom ingested approximately  $2\frac{3}{4}$  liters of this specimen, developed clinical or laboratory manifestations of hepatitis or other

illness during the 6 month period of observation.

#### COMMENT

The results show that the hepatitis virus was inactivated in heavily contaminated water treated by coagulation, filtration, and the application of sufficient chlorine to provide, after 30 minutes' contact, total and free residual chlorine concentrations of 1.1 and 0.4 p.p.m. respectively. The effect of the coagulation, settling, and filtration alone (no chlorine) was shown by the results with specimens 10 and 11. The ingestion of coagulated, settled, and filtered water was followed by a 43 per cent incidence of hepatitis. This represented a 40 per cent decrease in the



incidence as compared with that observed in the control group following ingestion of the untreated contaminated water. In a previous experiment,<sup>2</sup> coagulation and settling alone (water specimen 4, Table 2) also decreased the incidence of hepatitis by 40 per cent as compared with that in the group receiving untreated water (specimen 3). Although the groups are too small for the results to be statistically significant, the occurrence of a decrease in incidence in two consecutive similar experiments suggests that this part of the treatment had some effect on the virus. This effect probably was chiefly the result of a decrease in the concentration of the virus as the absence of any apparent difference in the severity of the disease resulting from specimen 11, as compared with that in the control group (specimen 10), suggested that the virulence of the virus was not appreciably influenced. It is of interest, however, that the *minimum* incubation period in those who received the coagulated, settled, and filtered water was 27 days whereas the *maximum* incubation period in the control group (water specimen 10) was 27 days (Table 2). This also was observed in the previous similar experiment, the minimum incubation period in those receiving coagulated and settled (but not filtered) water (water specimen 4, Table 2) being 33 days as compared with a maximum incubation period of 22 days in the control group (water specimen 3). Combining these two similar groups who received coagulated and settled (specimen 4) or coagulated, settled, and filtered (specimen 11) water and the two respective control groups (specimens 3 and 10), the mean incubation period for the former was 31.6 days (5 cases) and that for the latter was 21 days (9 cases). The minimum incubation period of 27 days in the former group was observed in only 1 case, the period in the other 4 ranging from 30 to 37 days. The maximum in-

cubation period in the combined control groups was 27 days, the period in 7 of the 9 cases ranging from 19 to 22 days. In spite of the small size of the groups involved, the difference in the mean incubation periods is statistically significant and shows that this type of water treatment (regardless of whether the effect was due to decrease in concentration of the virus, its virulence, or both) resulted in an appreciable increase in the length of the incubation period. Although not demonstrated conclusively, the data suggest that this was due chiefly to the coagulation and settling part of the procedure, the results with water that only had been coagulated and settled being similar to those with water which had been coagulated, settled, and filtered. The failure of this type of filter to remove the hepatitis virus, which passes through Seitz and other bacteria retaining filters, is not surprising as the diatomite filter did not retain bacteria (Table 1, bacteriological studies), although the bacterial count apparently was decreased by such filtration.

It is obvious, therefore, that the complete control of the hepatitis virus (and probably other infectious agents) in drinking water depends, in the final analysis, almost entirely on the disinfectant used and its proper application. These studies have shown that the application of sufficient chlorine to provide, after 30 minutes' contact, a total chlorine residual of approximately 1 p.p.m. and a free chlorine residual of 0.4 p.p.m. was capable of inactivating the hepatitis virus in heavily contaminated water when the water had been treated previously by coagulation, settling, and filtration. The minimal effective dose of chlorine under these conditions was not determined due to the lack of volunteers and the more urgent need of determining a reliable method for use by the army in the field.

Although the lowest dosage of chlorine applied, in these experiments, to coagulated, settled, and filtered water was effective in inactivating the hepatitis virus, the resulting total residual chlorine concentration was greater than that ordinarily required in municipal water practice. Conclusions regarding the adequacy, in respect to the hepatitis virus, of smaller doses of chlorine must await the determination of the minimal effective dose in coagulated and filtered water. It is significant however, that the 30 minute residual total chlorine concentration of 1 p.p.m., shown to be effective in coagulated, settled, and filtered water, failed to inactivate or attenuate this virus in previously untreated water.<sup>2</sup> The difference between the effect of the same total residual chlorine in untreated water as compared with that in previously coagulated, settled, and filtered water may be due in part to a conversion of most of the free chlorine to chloramines, which are known to be less active disinfectants than is free chlorine, by the greater quantity of unoxidized organic material in the former. This indicates the importance of proper pretreatment (coagulation, settling, filtration) of water, particularly if polluted water is the original source, in order to decrease the quantity of unoxidized organic materials before chlorine is applied.

These observations permit some speculation about a possible source of origin of some small outbreaks of infectious hepatitis and of some of the apparently sporadic cases. It is emphasized that the following observations are entirely theoretical and not based on factual evidence. As the virus of infectious hepatitis is excreted in the feces of infected persons and some communities use polluted streams as the original source of their water supply, it appears possible that any break or inadequacy in the numerous steps concerned in the preparation of such water

for human consumption might permit the survival of small quantities of hepatitis virus. Considering some of the many factors that may be involved—polluted water as the original source, probable wide variation in the degree of pollution, the final dependence of adequate disinfection on the quantity and efficiency of the disinfectant (chlorine) used, this in turn dependent on the composition of the water; variation of the composition with the degree of pollution and the efficiency of the coagulation and filtration procedures, the limitation imposed by palatability (taste, odor, etc.) on the quantity of disinfectant that can be used, the resistance of the hepatitis virus (and possibly some other viruses) to procedures which ordinarily destroy or eliminate bacteria, and the necessity of supplying large quantities of water continuously without interruption—it would not be surprising if small quantities of some of the more resistant infectious agents occasionally survived. This could account for some of the occasional small outbreaks of hepatitis or for apparently sporadic cases at widely separated points served by the same source of water.

#### SUMMARY AND CONCLUSIONS

1. The effect of certain procedures commonly employed in the disinfection of drinking water on a virus of infectious (epidemic) hepatitis has been investigated with the following results:

- a. Coagulation, settling, and filtration (diatomite filter) of contaminated water did not eliminate or inactivate the hepatitis virus as the disease developed in 40 per cent of the volunteers who ingested such treated water. However, this treatment resulted in a prolongation of the incubation period and a 40 per cent decrease in the incidence as compared with that in the control group.
- b. The application to such water (previously coagulated, settled, and filtered) of sufficient chlorine to provide, after 30 minutes' contact, total and free residual chlorine concentrations of 1.1 and 0.4

p.p.m. respectively apparently was adequate to inactivate the hepatitis virus under the conditions of this experiment. However, the same 30 minute residual total chlorine concentration (1 p.p.m.) in contaminated water that had not been pretreated by coagulation, settling, and filtration did not inactivate the hepatitis virus.

2. The complete control of the hepatitis virus (and probably other infectious agents) in drinking water depends almost entirely on the disinfectant as the virus is not eliminated or inactivated by preliminary coagulation, settling, and filtration of the water. The efficiency of the disinfectant varies with the character of the water and the resistance of the infectious agent concerned. Dosages of chlorine that are adequate for inactivation of the bacterial pathogens occurring in drinking water may not be adequate for the hepatitis virus, particularly if the water has a high content of unoxidized organic material. Conclusions regarding the adequacy, in respect to the hepatitis virus, of the dosages of chlorine ordinarily applied for the disinfection of water must await the determination of the minimal effective dose of chlorine in coagulated, settled, and filtered water.

**ACKNOWLEDGMENT:** These investigations were made possible through the cooperation of the administrative staffs of Selective Service (Camp Operations Division), the National Service Board for Religious Objectors, the American Friends Service Committee, the New Jersey State Hospital (Trenton, N. J.), and the Philadelphia State Hospital. We are particularly indebted to the members of the technical staffs of our laboratories in the

Hospital of the University of Pennsylvania and in the New Jersey State Hospital, Trenton, N. J. The assistance of various members of the staffs of the Biochemical Laboratory of the Philadelphia General Hospital, the William Pepper Laboratory of Clinical Medicine of the Hospital of the University of Pennsylvania, and the Laboratories of the New Jersey State Hospital in the conduct of certain phases of the studies is greatly appreciated. Finally, the authors gratefully acknowledge the contribution made by the members of the Civilian Public Service Unit No. 140, Philadelphia, Pa., who served as experimental subjects as well as assisting in the conduct of a large part of the technical work connected with the investigations.

#### REFERENCES

1. Neefe, J. R., and Stokes, J., Jr. An Epidemic of Infectious Hepatitis Apparently Due to a Water Borne Agent. *J.A.M.A.*, 128:1063 (Aug. 11), 1945.
2. Neefe, J. R., Stokes, J., Jr., Baty, J. B., and Reinhold, J. G. Disinfection of Water Containing a Causative Agent of Infectious (Epidemic) Hepatitis. *J.A.M.A.*, 128:1076 (Aug. 11), 1945.
3. Baty, J. B., Neefe, J. R., Reinhold, J. G., and Stokes, J., Jr. The Treatment of Water to Inactivate the Causative Agent of Infectious Hepatitis, to be published.
4. Havens, W. P., Jr. Properties of the Etiologic Agent of Infectious Hepatitis. *Proc. Soc. Exper. Biol. & Med.*, 58:203, 1945.
5. Neefe, J. R., Gellis, S. S., and Stokes, J., Jr. Homologous Serum Hepatitis and Infectious (Epidemic) Hepatitis: Studies in volunteers bearing on immunological and other characteristics of the etiological agents. *Am. J. Med.*, 1:3 (July), 1946.
6. Oliphant, J. W., Gilliam, A. G., and Larson, C. L. Jaundice Following Administration of Human Serum. *Pub. Health Rep.*, 58:1233, 1943.
7. Neefe, J. R., Stokes, J., Jr., Reinhold, J. G., and Lukens, F. D. W. Hepatitis Due to the Injection of Homologous Blood Products in Human Volunteers. *J. Clin. Investigation*, 23:836, 1944.
8. Beeson, P. B., Chesney, G., and McFarlan, A. M. Hepatitis Following Injection of Mumps Convalescent Plasma: I. Use of Plasma in the Mumps Epidemic. *Lancet*, 1:814-815 (June 24), 1944.
9. Ministry of Health, Memorandum prepared by Medical Officers. Homologous Serum Jaundice. *Lancet*, 1:83, 1943.
10. Hallinan, F. J. Test for Active Residual Chlorine and Chloramine in Water. *J. Am. Water Works A.*, 36:296, 1944.

# Investigations of the Swab Rinse Technic for Examining Eating and Drinking Utensils\*

LEON BUCHBINDER, PH.D., F.A.P.H.A., THEODORE C. BUCK, JR., PERCY M. PHELPS, F.A.P.H.A., RAYMOND V. STONE, D.V.M., F.A.P.H.A., AND WALTER D. TIEDEMAN, M.C.E., F.A.P.H.A.

*Department of Health, New York, N. Y.; City Department of Health, Baltimore, Md.; State Department of Health, Grand Rapids, Mich.; Los Angeles County Department of Health, Los Angeles, Calif.; and State Department of Health, Albany, N. Y.*

AT the Annual Meeting of this Association in 1943 the Subcommittee on Food Utensil Sanitation of the Committee on Research and Standards submitted a revision of the technic for the bacteriological examination of food utensils.<sup>1</sup> Suggestions and criticisms were invited with a view to making further modifications so as to get the technic in generally acceptable form for standardization.

The chairman of that subcommittee reports having received many suggestions, that ranged from one to the effect that the technic was not precise enough, to one that it was too complicated for ordinary use. The suggestions for changes in the technic emphasized the need for more factual information to determine the need for standardizing various details of the technic and the values to be set.

A series of studies was suggested to secure the required data which the members of the subcommittee were not in a position to undertake. The newly

organized National Sanitation Foundation undertook to sponsor this work which has been done by the group submitting this paper. The work has not been completed, but enough has been accomplished to justify this report of progress. Further comments will be welcomed and given consideration in completing the work.

At the outset it should be stated that the purpose of this work is not to recover the greatest number of bacteria possible from washed and sanitized utensils but to develop the technic that is likely to reveal the presence of relatively few bacteria on utensils and to give the most nearly uniform results under all conditions in the hands of average laboratory technicians.

Each of the four participating laboratories undertook to run a series of critical tests of the various details of the technic, particularly those that have been questioned. Among these details are the time interval between swabbing and plating, the use of wood or wire applicator rods, the number of times each surface should be covered by the swab, whether the direction of each stroke in swabbing should be the same

\* Presented before the Laboratory Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 11, 1946.

or reversed, the area of plates to be covered and the need for a template to measure such area. Other details are the buffering of the distilled water to be used and the type of agar. The possible effect of caps and the applicator sticks on the pH of the rinse and therefore on the count. Another point to be investigated is the time of survival of bacteria on utensils to be swabbed.

In order to secure soiled plates, cups, glasses, forks, and spoons for testing that would have similar numbers of organisms on them a procedure was adopted for soiling them. A quantity of water was collected from the wash water tank of a dishwashing machine in a restaurant after it had been used for an hour or more for washing dishes. A sample of this water was plated in order to get an approximation of the number of bacteria present while the main portion was being held in a refrigerator to lessen the growth of bacteria. After 24 hours, when an approximation of the number of bacteria present was obtained, the water was diluted to an extent determined by trial so that the desired number of bacteria were left on test utensils. Carefully cleaned and dried and sterilized plates, cups, glasses, forks, and spoons were submerged in this diluted dish water and then allowed to drain and dry.

In much of the work an effort was made to have the counts on these soiled utensils fall somewhere near the common standard of 100 per utensil as this is the critical range in which the greatest consistency is desired. Furthermore, the significance of differences in counts is more apparent in the lower range.

Buck found that wash water with a high detergent content, that is, with a pH above 9.6, produced colonies of the spreader type and was not suitable for this work. He also reports finding thermophylic organisms in the wash

water and that the recovery of organisms from utensils soiled with high count wash water was surprisingly low. Stone found the use of soiled wash water from dishwashing machines to be unsatisfactory due to the difficulty in securing it without alarming operators, to variations from meal to meal in such things as fat content, and to the fact that alkalinity and temperature determined the type of organisms surviving. Stone also had trouble with thermophiles. Furthermore, the organisms in this soiled water did not adhere well to the utensils. Stone used cultures of coliform bacteria and staphylococci in an inert gum called carboxy methyl cellulose. This gave an excellent soiling medium that adhered well to the surface and yielded nicely to swab collection after soiled rims were inverted for several minutes in a pan of water.

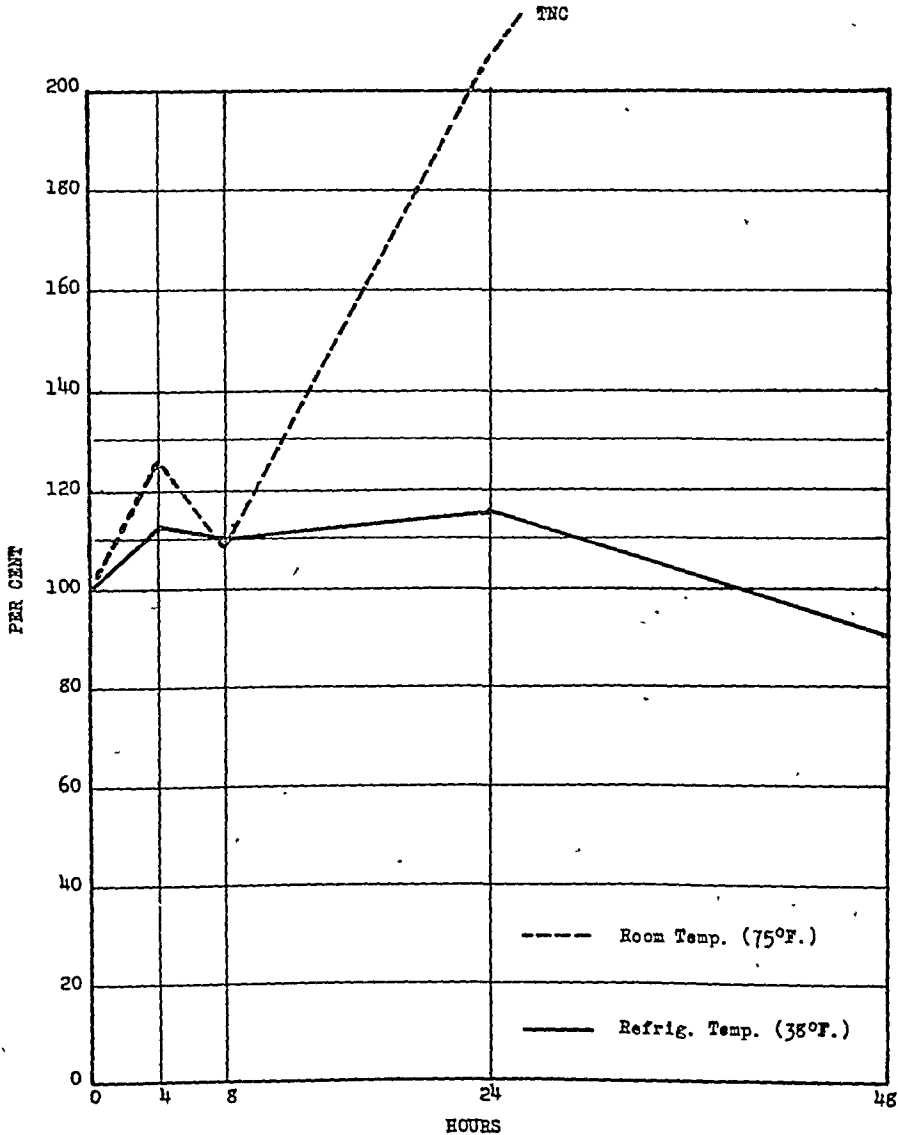
The proposed technic required the plating of samples of the rinse water within 4 hours after swabbing. This precludes the shipment of rinse samples to laboratories and limits the usefulness of the test. This provision was based on work which showed that a single species of bacterium died off in the rinse water. As has been indicated wash water from commercial dishwashing machines or a mixed culture of coliform organisms and staphylococci was used in making this test. These are organisms more likely to be found on utensils washed by machine than that used in previous tests. Generally thermoduric or thermophylic organisms predominate. The work of all the investigators on the delayed plating of such rinse water shows that when held at refrigerator temperature the count at the end of 24 hours did not vary greatly from that at the end of 4 hours. This was true whether the count was low or high. There were variations in individual tests. The differences between counts obtained by plating portions of any one sample at 4, 8, and 24 hours

are close enough, however, to make it unimportant when the plating is done within a 24 hour period. It is necessary that the sample be refrigerated because at about 75° F. growth was found to be profuse after 8 hours. Figure 1, prepared by Buchbinder, gives a summary of the results on all utensils of four experiments with rinse samples held at refrigerator temperatures and of three experiments with rinse samples held at about 75° F.

Considerable doubt has been expressed as to the length of time that organisms left on utensils during the washing and sanitizing processes will remain viable. In two experiments with low count utensils, Buchbinder found that plates stored unstacked in an open room showed a marked increase in count during the first 3 hours whereas all other utensils showed little variation during the first 24 hours. Three experiments with high count

FIGURE I

EFFECT ON COUNT OF TIME OF PLATING RINSE SOLUTION  
IN PERCENTAGE OF INITIAL COUNT (BUCHBINDER)



dishes showed a similar increase in count on plates during the first 3 hours followed by a decrease to about the original number during the next few hours, and then a fairly constant status for 24 or 48 hours. Other utensils with high counts, however, showed a decrease in count during the first 6 hours, averaging about 70 per cent, which leveled for utensils stored in a closet. The low count utensils which are of special interest to enforcement officials, generally showed proportionally higher counts after storage than did those with original high counts. Comparative tests on utensils stored without stacking out of the direct sunlight in an open room and in a dark closet showed little difference in the general trend. Both high and low count plates, whether kept in a room or in a closet, increased in count considerably during the first 3 hours. However, high count plates stored for 24 hours gave within 30 or 40 per cent of the original count whether kept in a room or dark closet. Increases in counts on storage must indicate either deposition of air-borne bacteria or growth. Buck reports that as many as 300 organisms were deposited in 24 hours on an open agar Petri plate. However, he too found a considerable decrease in the number of organisms remaining on utensils after 24 hours.

In practice most utensils would be examined at the time of an inspection made between breakfast and lunch or between lunch and dinner or within 4 hours after they are washed. This work indicates that if a utensil were entirely free from organisms after being washed and sanitized and were stored in a clean place as required, it should not pick up more than the usually allowable 100 organisms per utensil from the air. If more should accumulate, however, the air-borne organisms would be objectionable since their presence would indicate improper handling. Furthermore, the

rate of dying off of organisms, whether stored in a light or dark place, is not so great that a utensil with an initial count much greater than 100 is likely to show a satisfactory count after standing for 4 hours. Moderately high counts might change, however, to passing counts in this time.

The proposed technic specifies the use of wooden applicator sticks the lengths of which are not fixed. These sticks are broken off before shaking, which allows sufficient disintegration of the cotton swab during shaking. Some workers were reluctant to change from stainless steel wire to the use of wood for this purpose without more factual evidence of the need for changing. The use of cotton is specified without saying what kind of cotton, although this may make considerable difference. Tests were run using wooden applicator sticks and stainless steel wire ones. The cotton was removed from the wire rods with sterile forceps for a third comparison. In 59 tests on various utensils Buchbinder found that in 39 instances those tests made with wood applicators gave higher counts than the metal ones, the same count in 4 instances, and lower counts in only 16 trials. This constituted a significant difference in favor of wooden applicators. When the cotton on the metal applicators was removed with sterile forceps to permit more complete disintegration, the tests made with wooden applicators gave higher counts in only 29 instances, the same counts were obtained in 11 tests, while tests made with metal rods gave higher counts in 19 instances. This difference is not mathematically significant. However, the work of detaching the cotton takes considerable time and Buchbinder, therefore, favors the use of wooden applicators broken off before shaking. The work of the other investigators was in agreement and they also concluded that the use of wooden applicators is desirable. Buck and Kaplan<sup>2</sup>

have proposed the use of a simple sterile cutting device for this purpose. Stone points out that the flexibility of the wood in conforming to the shape of the utensil also is an advantage in making good contact with the whole surface to be swabbed.

Stone conducted some experiments designed to compare absorbent cotton, non-absorbent cotton, and glass wool as swab material. It is clear that the material used must perform the somewhat conflicting tasks first of snaring bacteria and then of releasing them as completely as possible in the rinse water. At best many organisms are retained in the cotton after shaking. Stone's work indicates that non-absorbent cotton gives the most uniform results of any of the three materials tested.

The proposed technic does not include a requirement as to the pH of the rinse solution after sterilization which appears to be of considerable importance. When bakelite caps on screw cap vials were substituted for aluminum ones Black found that some of these caps would not withstand sterilization and that many of them changed the pH of the sterilized rinse solution. Black found a source of mineral filled bakelite type caps which stood the test of withstanding sterilization without releasing any chemical that would affect the bacteria in the rinse solution. Similarly, Phelps reports that both applicator sticks and cotton in the swab may affect the pH of the rinse solution to increase the acidity of the rinse solution. He found a standard baby swab that had little if any effect on the pH. It may be necessary to specify materials and to require the spot checking of the pH of the rinse solution in vials after sterilization with the applicator and cotton in place.

The proposed technic provides for running the swab slowly and firmly 3 times over the surface to be examined. Questions have been raised as to

whether the direction should be reversed between strokes and as to whether better uniformity might be obtained by increasing the number of strokes. In a series of two experiments with high count utensils and three with low count utensils Buchbinder found that counts increase progressively with the number of strokes. He found that with high count utensils the mean count with 5 strokes was about 60 per cent greater and with 10 strokes, 80 per cent greater than the mean count obtained with 3 strokes. Similarly on low count utensils the mean count with 5 strokes was approximately 20 per cent greater and with 10 strokes, 30 per cent greater than that obtained with 3 strokes. It also was found that with high count utensils (between 40,000 and 100,000), reversing the direction of strokes decreased the count in all tests, whereas with low count utensils (between 800 and 1,200), reversing the direction between strokes increased the count from 5 to 15 per cent. In covering an area of 4 square inches Buck recovered more than 3 times as many organisms using 10 strokes reversing directions between strokes as he obtained with 10 single strokes in a single direction. It is evident that further standardization of this detail of the method is desirable. It also is suggested that additional thought be given to making the areas swabbed on utensils of different types nearly equal within practical bounds.

Among the criticisms of the proposed technic that were received was one to the effect that the entire surface of plates should be swabbed. This point is to be investigated but the work has not been completed.

Another point criticised was that the use of metal templates, which require flaming between use, to measure a 4 sq. in. area was too laborious. It was suggested that an approximation would do as well. Buchbinder found that counts made by swabbing 4 sq. in.



by template and 4 sq. in. by guess were similar. He noticed a tendency to overwab by guess, but this had no serious effect on the results. Buck also reports little difference between counts on plates similarly soiled with results obtained by approximating the 4 sq. in. area and by fixing the exact area by template. In this connection if exact measurement should seem desirable the use of single service sterilized templates made of Kraft paper has been suggested.

Stone reports some work on the composition of the medium to be used in plating the rinse solution. The proposed technic specifies the use of standard tryptone glucose extract agar (without milk). Media suggested for investigation are the old nutrient agar consisting of 3 per cent beef extract, 5 per cent peptone and agar without dextrose, the same with tryptone and dextrose, the same with tryptose and dextrose, and the same with neo-peptone and dextrose.

Some work in the investigation of the composition of the buffered distilled water has been done and more is contemplated. Special attention is being given to the possibility of adding a neutral wetting agent.

#### SUMMARY

An important decision reached is that if the samples of rinse water are kept at 40° F. or less without freezing, plating at any time within 24 hours after sampling is satisfactory. This makes the test available to those who have found that the best time to collect samples at bars is during the evening rush hours and also to those who must ship samples to the laboratory. The work also shows that there are sound reasons for requiring the use of 3 inch long wooden applicator sticks broken off before plating; for specifying the use of non-absorbent cotton; for controlling the pH of the rinse water as ready for use, that is taking into account any effect of the cap, applicator

stick, and cotton. Enough of the bacteria on dry utensils will persist for 4 hours or more, or for the usual interval between the morning and noon, and noon and evening meals, to make it possible to detect the use of ineffective washing and sanitizing processes. It is recognized that some deposition of airborne bacteria on such utensils is likely to occur.

It also is evident that increasing the number of strokes in swabbing increases the number of bacteria recovered from the surfaces of utensils, and it makes a slight difference whether the strokes are reversed or are all in the same direction. In other words this detail must be standardized. The work indicates that whether the area swabbed on plates is measured by template or approximated is not of great importance. The use of a template involves extra equipment and work. Also areas on cups and glasses are approximated.

The work is not completed but there is a good prospect of getting it done within the next year. Although the final determination of the medium to be used for this work may be influenced greatly by the media used in public health laboratories, for other work a farther comparison of media is desirable. Further standardization of a soiling medium for this work also is desirable as is more work on the composition of the buffered distilled water.

After the Subcommittee on Food Utensil Sanitation has reached a decision as to the details of the revised technic some critical work should be done to determine the degree of uniformity that may be expected in the use of the technic.

#### REFERENCES

1. Subcommittee on Food Utensil Sanitation, American Public Health Association. *A Proposed Method for the Control of Food Utensil Sanitation A J.P.H.*, 34:255 (Mar.), 1944.
2. Buck, T. C., Jr., and Kaplan, E. 'A Sterile Cutting Device for Swab Vial Outfits Utilizing Wood Applicators' *J. Milk Tech.*, 7 (May-June), 1944

# Dishwashing Practice and Effectiveness (Swab-rinse Test) in a Large City as Revealed by a Survey of 1,000 Restaurants\*

HYMAN J. KLEINFELD, PH.G., AND LEON BUCHBINDER, PH.D., F.A.P.H.A.

*Bureaus of Food and Drugs and Laboratories, Department of Health, New York, N. Y.*

THE purpose of this survey was to obtain a representative picture of dishwashing practice and effectiveness in New York City. This, as far as is known, is the first large-scale study carried out in a large city. It was hoped that analysis of the findings obtained might indicate a program for the improvement of eating utensil sanitation in this city.

## TECHNIC

A total of 1,005 restaurants were studied and 3,657 swab samples of utensils were secured in the years 1944 and 1945. This was prior to the present clean-up program of the Health Department. The first 196 restaurants examined were chosen by locality or to check a given type of establishment or process. The remainder were chosen by selection of every 20th card from an alphabetical card index file of approximately 20,000 restaurants in New York City.

Dishwashing efficiency was determined by means of the swab-rinse test. The technic of swabbing of utensils followed the procedure recommended by the U. S. Public Health Service.<sup>1</sup> The

maximum interval of 4 hours between sampling and plating recommended by the U.S.P.H.S. was adhered to in most instances, but in a few unavoidable instances the interval was extended to 5 hours.

Although every effort was made to obtain freshly washed utensils for swabbing, this was not always possible, particularly when samples were taken during rush periods. As a result, utensils tested were frequently selected from those ready for service and no information was available as to the elapsed time between washing and sampling. In studies now being carried on in this laboratory it has been clearly shown that there is a marked reduction in the number of recoverable bacteria while utensils are drying, and that the death rate is maintained at a reduced but appreciable level for a number of hours after the utensils have dried.<sup>2</sup> If it had been possible to secure uniformly freshly dried utensils for sampling, a more accurate picture of dishwashing effectiveness might have been obtained.

The procedure for the examination of the swab samples in the laboratory followed that of the proposed method of the A.P.H.A.<sup>3</sup> The major deviation from this technic was that metal swabs were used instead of wooden ones. This

\* Presented before the Engineering Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 12, 1946.

technic fails to reveal the presence of as many organisms as does the use of the wooden swab.<sup>2</sup>

#### DESCRIPTION OF TYPES OF RESTAURANTS AND WASHING EQUIPMENT

The restaurants visited during the survey are arbitrarily sorted for description and analysis of the data obtained into five categories: cafeteria, waiter service, bar, luncheonette, and open stand.

*Cafeterias*—These restaurants are usually large and of the self-service type, i.e., ones in which patrons select silverware from an open tray, glasses from racks at a drinking fountain, and food from a counter. Cups are the only utensils sampled which are distributed individually by the cafeteria personnel.

*Waiter Service*—This category includes restaurants where food is served by a waiter to patrons seated at tables, as distinguished from cafeterias where patrons serve themselves, and luncheonettes where they usually are served at a counter. Included in this group are the most expensive restaurants in the city. Waiter service establishments may have bars, and if so, bar glasses were sampled.

*Bars*—The serving of liquor is the main business in this type of restaurant, while the serving of food is incidental. Frequently knives, forks, and cups which may not have been used for a long time were sampled at these establishments. Glasses, on the other hand, were often sampled from the drain board immediately after the washing process.

*Luncheonettes*—Most of the patrons in this type of establishment sit at a counter although some may be served at tables. These are usually small establishments and include the so-called diners (dining cars).

*Open Stands*—This type of establishment usually has no seats and the patron is served, from an open counter facing the street, with coffee, sandwiches, frankfurters, cold drinks, etc.

#### DISHWASHING

The two main types of dishwashing operations found were hand washing and machine washing. The washing of glasses and crockery was carried out in one of the following ways:

*Hand Wash*—The usual type of washing equipment consists of a two compartment sink. One compartment is designed as a wash sink and the other as a rinse sink. This latter is usually equipped with a gas burner underneath, the function of which is to maintain the water in the sink at a temperature of 180° F. and with a wire basket for holding dishes in this scalding water. Another type of sink used has three compartments. The functions of the three compartments are those of washing, rinsing, and scalding.

*Machine Wash*—Four distinct types of machine washing operations were observed.

*Counter Type Machine*—This machine is a simple rinse spray and has no recirculating tank. Water is sprayed from nozzles connected directly to a city water line without auxiliary pumping. Some machines have a device for mixing hot and cold water and others a device for mixing detergent with the rinse water.

*Single Tank Machine*—This machine, which may be either of the "push through" or "closed door" variety, has a wash tank, which should contain water and a detergent, and a separate rinse spray. The wash tank water is recirculated and sprayed on the utensils by a pump. Thus, the same water is re-used for variable periods of time on succeeding batches of utensils. Rinse water is sprayed directly from a city water line without additional pump pressure. The rinse water drains into the wash tank thus constantly diluting its content of both soil and detergent.

*Double Tank Machine*—This machine has a wash tank and a rinse tank and a final so-called curtain rinse spray.

Water from each tank is recirculated separately by force pumps and sprayed onto the utensils. The final rinse comes directly from a city water line and drains into the rinse tank.

*Triple Tank Machine*—This machine has three tanks with a pump for each. The first is a wash tank and the others are rinse tanks. There is also a final curtain rinse.

Silverware was found to be washed by hand or machine in one of the following ways:

*Hand Wash*—The soiled utensils are usually first dropped into a wooden tub containing water and allowed to soak. They are then placed in a wire basket, plunged into soap solution, and rinsed in hot running water. A superior hand washing technic makes use of a series of two cylindrical sinks, each of which is heated by means of a steam jet, steam jacket or gas burner. The utensils, which are handled in wire baskets, are plunged into and shaken in a strong soap solution in the first sink and then rinsed in steaming hot water in the second sink. After rinsing they are emptied on cloths and are then usually dried with a towel.

*Machine Wash*—Silverware may be washed mechanically by either of the following methods: (a) spread in a single layer in shallow metal trays and passed through a standard spray type washing machine, or (b) washed in a special silverware washing machine. The latter machine consists of two main parts. One is a cast iron cylinder, with perforations and a removable end, in which silverware is placed together with a detergent. The other is a horizontal tank into which the cylinder is placed. The tank is closed and the cylinder rotated by gears connected with a motor. A slow stream of hot water mixes with the detergent and washes the utensils. When the water valve is opened fully, the utensils are automatically rinsed. Finally, hot air under pressure is ad-

mitted to dry the utensils. This last step is automatically timed.

A number of establishments which wash by hand or machine also burnish their silverware at intervals with a special machine. This technic also promotes better bacteriological cleanliness of silverware.

#### RESULTS

All the swab-rinse data are summarized briefly in Table 1 where they are listed under the categories of hand washing and machine washing. The number of samples of the several types of utensils studied which meet the standard of no more than 100 bacteria per utensil are listed as such and are also expressed as percentages of the total number of samples. Percentages based on a standard of 1,000 bacteria per utensil are presented in the same table. Perhaps the most important finding is that in only one of the eight groups of utensils, glasses washed by machine, do the samples which meet the 100 standard exceed 50 per cent of the total number studied. It is further noticed in the table that the machine washing of glasses and cups yields results which are far superior to those obtained by hand washing of the same utensils, the difference in each instance being highly significant. There is, on the other hand, no significant difference in the apparent effectiveness of machine and hand operations with either spoons or forks. When the 1,000 standard is used as a basis of comparison, the results are very similar. It is noted that the combined samples for machine washed spoons and forks which pass (74.9 per cent) are just significantly greater than the combined samples of the same utensils washed by hand (68.6 per cent). As a matter of fact, the combined passing average for all silverware (spoons and forks) washed by hand is greater by far than that of glasses and cups washed by hand. This difference is at least

TABLE 1

*Comparison of Swab-rinse Findings of Utensils Washed by Hand and by Machine  
(All Samples)*

Utensils	Hand Washing, 877 Establishments			Machine Washing, 175 Establishments			D(%)	S.E. <sub>diff.</sub>	Diff.
	No. of Samples	No More than 100 Bacteria per Utensil		No. of Samples	No More than 100 Bacteria per Utensil				
		No.	Per cent		No.	Per cent			
Glasses	1,046	113	10.8	131	68	51.9	41.1	3.35*	12.27
Cups	629	63	10.0	179	59	33.0	23.0	3.04	7.56
Spoons	733	258	35.2	137	55	40.1	4.9	4.47	1.09
Forks	688	251	36.5	114	34	29.8	6.7	4.83	1.40
	No. of Samples	No More than 1,000 Bacteria per Utensil		No. of Samples	No More than 1,000 Bacteria per Utensil		D(%)	S.E. <sub>diff.</sub>	Diff.
		No.	Per cent		No.	Per cent			
Glasses	1,046	245	23.5	131	93	71.0	47.5	4.18	11.36
Cups	629	243	38.7	179	102	56.9	18.2	4.21	4.32
Spoons	733	497	67.8	137	103	75.2	7.4	4.28	1.73
Forks	688	478	69.5	114	85	74.6	5.1	4.64	1.09

\* The calculation of the standard error of the difference in percentages (S.E.<sub>diff.</sub>) is illustrated as follows for glasses:  $S.E._{diff.} = \sqrt{\frac{15.4 \times 84.6}{1046} + \frac{15.4 \times 84.6}{131}} = 3.35\%$  where 15.4% is the total per cent passing, namely  $(113 + 68) \div (1046 + 131)$  and 84.6% is the total per cent failing, namely  $100\% - 15.4\%$ . A ratio of Difference/S.E.<sub>diff.</sub> of 2 or more is generally regarded as statistically significant.

partially due to the special treatment which silverware received. It is of interest that in another study the machine washing of glasses was also revealed to be superior to hand washing of the same utensil, but that the bacterial quality of spoons and dishes washed by machine was found to be no better than that of those washed by hand.<sup>4</sup> In summarizing the data in Table 1, apart from the generally poor conditions disclosed, it is obvious that machine washing of glasses and cups yields results definitely superior to hand washing. No such clear-cut difference appears for spoons and forks. The data on spoons and forks will be examined in greater detail subsequently.

A comparison of hand and machine washing is made in Table 2 on the basis of the standard of no more than 100 bacteria, with the data further broken down according to the types of establishment sampled. The findings include those from cafeterias, waiter service restaurants, luncheonettes, and bars. Those from open stands are omitted be-

cause the number of samples was too small to be statistically significant. When the machine and hand washing processes for glasses and cups in the first three types of establishments are compared, it is noted that significant differences again exist. The degree of significance, as noted in the final column, is less for each type of establishment, as would be expected, than for all establishments combined (Table 1), and also differs among the several types of establishments. The differences for both waiter service and luncheonette restaurants are both of clear-cut statistical significance, whereas those for cafeterias are just significant. The results of the washing of silverware by the two methods show the lack of significant differences previously indicated in Table 1, with the exception that in luncheonettes, machine washing apparently did produce a significantly higher passing percentage of spoons than did hand washing. When the quality of hand washing of the several types of utensils in each of the four types of

TABLE 2

*Comparison by Types of Establishments of Swab-rinse Findings on Utensils Washed by Hand and by Machine*

Utensils	Hand Wash			Machine Wash			D(%)	S.E. <sub>diff.</sub>	Diff. S.E. <sub>diff.</sub>
	No. of Samples	No More than 100 Bacteria per Utensil		No. of Samples	No More than 100 Bacteria per Utensil				
		No.	Per cent		No.	Per cent			
113 Establishments			57 Establishments						
Cafeteria									
Glasses	120	6	5.0	22	7	31.8	26.8	6.68	4.01
Cups	71	2	2.8	58	11	19.0	16.2	5.33	3.04
Spoons	93	17	18.3	37	12	32.4	14.1	8.08	1.74
Forks	91	22	24.2	32	8	25.0	0.8	8.82	0.09
208 Establishments			63 Establishments						
Waiter Service									
Glasses	228	22	9.6	65	37	56.8	47.2	5.63	8.38
Cups	157	13	8.2	68	22	32.4	24.2	5.26	4.60
Spoons	179	65	36.4	56	21	37.5	1.1	7.39	0.15
Forks	173	63	36.4	50	15	30.0	6.4	7.66	0.84
260 Establishments			47 Establishments						
Luncheonette									
Glasses	285	29	10.2	34	17	50.0	39.8	6.46	6.16
Cups	259	21	8.1	45	21	46.7	38.6	5.57	6.93
Spoons	264	72	27.3	42	22	52.4	25.1	7.66	3.28
Forks	246	62	25.3	29	11	38.0	13.7	8.66	1.58
275 Establishments									
Bar									
Glasses	388	50	12.9 ± 1.70*						
Cups	126	23	18.2 ± 3.22						
Spoons	181	98	54.1 ± 3.71						
Forks	173	102	59.0 ± 3.74						

\* 1.70 is the Standard Error of the value 12.9% computed as  $\sqrt{(12.9) \times (87.1)/388}$ . In general the true % may be regarded as falling somewhere within 2 S.E. of the obtained value.

establishments listed is compared, the major differences in Table 1 are again noted; i.e., in each instance, samples of spoons and forks passed more frequently than did those of glasses and cups.

It is also observed from the table that the overall picture of cafeterias is the poorest while that of bars apparently is the best of those establishments which wash by hand. Thus the standard of excellence of cups in bars is somewhat higher than that in any of the other types of restaurants, even though the total percentage of passed samples for bars is under 20. Likewise, the relative cleanliness of the silverware sampled in bars is, at first glance, surprising; both spoon and fork samples passed more times than they failed. These results, 54 per cent and 59 per cent respectively, are superior by far to any of those ob-

tained with silverware in the other types of establishments. It should be made clear, however, that the superior cleanliness of silverware and cups in bars probably is due to circumstances unrelated to dishwashing practice. It is the fortuitous coincidence of (1) a state law which compels all establishments serving liquor at retail to serve food as well, and (2) the technic used in our survey. Bars, as a result of the law, carry a stock of eating utensils even though most of them serve food only infrequently. This fact was not considered in the survey and as a result utensils were sampled which probably had not been used for some time. Such a procedure, as has been mentioned earlier, gives a misleadingly low estimate of the number of microorganisms present when the utensils were freshly dry. The

above conclusion is confirmed by the fact that the status of the bar glass, the commonly used bar utensil, is no better than that of the waiter service or luncheonette restaurant, being superior only to that of the cafeteria.

When findings for hand washed utensils in cafeterias, waiter service restaurants, and luncheonettes are compared it is seen that, although the passing percentage of both glasses and cups from cafeterias are lower than those of the other two types of restaurants, these differences are not significant. When the results with glasses and cups in each of these three types of restaurants are consolidated, however, that of cafeterias is found to be just significantly poorer than those of either of the other two. The passing percentages of spoons and forks from waiter service establishments seem to be just significantly better than those of the other two types but when the findings for spoons and forks are pooled the differences become definitely significant.

It is of interest when the findings for machine washed utensils are compared, that cafeterias generally still occupy the poorest position.

Further analyses were made of hand and machine washing of silverware in an attempt to ascertain causes for the apparent lack of superiority of machine

washing. The hand wash data (spoons and forks combined) were divided into two groups; in one were placed the findings obtained in restaurants which washed in baskets and rinsed in very hot water, and in the other those which used neither baskets nor an adequate sterilization technic. The corresponding machine wash data were broken down into three groups, one for single tank machines, another for double tank machines, and the third for the special silverware machine previously described under Technic. Too few samples of silverware for adequate analysis were obtained from counter type machines, which were found in only 12 luncheonettes and open stands. It is of interest, however, that 21 of 29 (72 per cent) samples of glasses and cups from these machines did pass. Likewise, triple tank machines which were found only in six waiter service establishments also yielded too few silverware samples to record, although here too glasses and cups combined yielded a fair passing percentage, 14 of 26 (56 per cent). A comparison of the findings is contained in Table 3.

The first point of interest in Table 3 is that only about 5 per cent (53 of 1,030) of samples of hand washed utensils were obtained from restaurants which had clearly complied with the present New

TABLE 3  
*Comparison of the Washing of Forks and Spoons by Several Hand and Machine Technics*

	Total No. of Samples	Samples with Count No More than 100	
		No.	Per cent
Hand Wash *			
(High Temperature Water and Basket)	53	25	47
Hand Wash †			
(Low Temperature Water and No Basket)	977	293	30
Machine Wash			
(Special)	28	19	68
Machine Wash			
(Single Tank)	123	44	36
Machine Wash			
(Double Tank)	50	8	16

\* Includes all types of establishments.

† Includes only cafeterias, luncheonettes and waiter service establishments.

York City Sanitary Code. These few establishments use an approved rinsing technic and water at high enough temperature. It is also worthy of note that this small group of samples met the standard of 100 more frequently (47 per cent) than did the remaining large group (30 per cent). This difference is statistically just significant. The high temperature hand wash results are also definitely superior to those of the double tank machine.

The most interesting finding in the machine data is the indicated marked superiority of the special silverware machine, as shown by the high passing percentage (68), over the single tank machine (36 per cent) and the double tank machine (16 per cent). The results with the special silverware machine are also superior to those of the great majority of establishments which wash by hand but are not statistically better than those of the relatively few samples from establishments which wash by hand and rinse with water in the proper temperature range.

#### AN EXAMPLE OF SATISFACTORY MACHINE OPERATION

Some 79 establishments which use single tank machines, the most common type, were studied. The general average of results obtained from this type of machine was raised by the findings obtained in a chain of luncheonettes. This organization, which sells food at very moderate prices, has developed an exceptional technic not only in dishwashing practice but also in the general sanitary operation of its establishments. A single tank machine whose operation is uniform is used in each restaurant. The operation is as follows: A trayful of dishes is inserted into the machine, a tablespoonful of trisodium phosphate is spread over the dishes manually and a sliding door is closed, automatically locking the machine. The process is started by press-

ing a button and the utensils are automatically washed for 2 minutes and rinsed for 15 seconds. The machine automatically stops when this operation is completed and the door may then be opened. Silverware is soaked or pre-rinsed in a shallow well of water with detergent before it is placed in the machine. It should be noted that there is no automatic control of hot water temperature nor automatic addition of detergent. An adequate supply of hot water, however, is furnished by a local steam company. It should be mentioned in fairness to the dishwashing problems of other establishments that the menu in this chain is limited to sandwiches, soups, frankfurters, pies, cakes, fruit juices, coffee, and milk.

A special swab-rinse study of some ten restaurants of this chain was made to determine what a well ordered process could accomplish. Fifty-three swab-rinse samples of glasses, cups, and spoons were obtained. Counts of these samples in all instances were under 100 with some showing very few bacteria.

A machine in one of these restaurants was used by us for some special tests in which the water temperature was lowered. It was found that all the samples of cups, glasses, forks, and spoons rinsed at temperatures ranging from 84° to 140° F. complied with the bacterial standard. It might be concluded from this that water temperature is not a very critical item if the detergent and the duration of wash and rinse are adequate. Findings similar to these have been reported by Tiedeman,<sup>5</sup> by Ward and Dack,<sup>6</sup> and by others.

#### DISCUSSION

The state of dishwashing practice and accomplishment as found in this survey is, on the whole, dismal. These swab-rinse results, however, are apparently not much worse than those which were found in surveys carried out in several sections of the United States during a



corresponding period (1944 and 1945) by mobile laboratories of the U. S. Public Health Service.<sup>7</sup> Thus, while we found that 303 of 1,985 (15.3 per cent) samples of cups and glasses passed the 100 bacteria per utensil standard, the U.S.P.H.S. found that only 3,894 of 14,664 (26.5 per cent) samples of the same utensils were satisfactory by the same standard. Likewise, we found that 598 of 1,672 (35.7 per cent) samples of forks and spoons met the standard and the U.S.P.H.S. found that 2,423 of 7,086 (34.3 per cent) samples of spoons passed in its surveys. It seems, therefore, that much must be done to improve the status of utensil washing in restaurants. There is good reason to believe that such improvement is entirely feasible.

#### AN ESTIMATE OF THE FUTURE USEFULNESS OF THE SWAB-RINSE TEST IN NEW YORK CITY

Our findings seem to indicate that in the presence of an effective dishwashing technic, the swab-rinse test usually yields a result which is in compliance with the standard of no more than 100 bacteria per utensil as advocated by the A.P.H.A. It can be stated generally that, when the dishwashing operation is visually satisfactory to an experienced inspector, the swab-rinse test usually yields a satisfactory count; when the practice is questionable, on the other hand, a satisfactory count may or may not be obtained; finally, when the practice is obviously poor, the count usually fails to meet with the standard.

#### CAUSES OF POOR MACHINE WASHING

The main defects in machines are in original design and in operation. Defects in design are difficult to rectify in existing models in which the fundamental design is inadequate. The effects of poor design, however, may be ameliorated if all that is needed is the addition of timing devices or tempera-

ture controls or the alteration of certain small parts. Operational technic can be improved by the educational efforts of properly trained inspectors. Some defects noted in the operation of counter type and single tank machines are listed.

*Counter Type Machine*—Three common defects were found in the operation of this type of machine. The rinse water rarely reached 180° F., the city water pressure was often inadequate, and the application of detergent was irregular. It was found that operators were reluctant to use very hot water even if it were obtainable because of the fear that they might burn their hands. Although most machines are equipped with semi-automatic detergent dispensers, it was noted that operation of these dispensers was often deficient and as a result the detergent well overflowed. The feeding of detergent was inconstant for this and other reasons. It should be reiterated that despite these deficiencies the swab-rinse findings from the twelve establishments which used counter types machines indicated fairly good operation.

*Single Tank Machine*—Poor results from this type of machine are usually caused by haphazard timing of the wash and rinse operation and the irregular addition of detergent. The operator of a single tank machine frequently determines the duration of the wash and rinse periods by manipulating a handle. Obviously at that time of the day when clean dishes are at a premium, the operation will be rushed.

#### SUMMARY OF DEFECTS

The following are the chief defects observed in operation or construction of machines during the survey:

1. Dishes are not scraped or prerinsed.
2. The time of washing and rinsing is insufficient to clean or sterilize the utensils.
3. Water pressure is insufficient in the absence of auxiliary pumping

4. The rate of dilution of water in the wash tank compartment by waste rinse water is often too great in single tank machines so that the detergent may be dissipated. The rate is insufficient in multiple tank machines so that too great an increase of bacteria and other organic material may occur.

5. The wash and rinse tanks in multiple tank machines are sometimes constructed so as to permit a flow of water from the wash tank to the rinse tank with consequent contamination of the rinse water.

6. Nozzles are often clogged with food and are not regularly cleaned. In certain sections of the city, where hard water is used, lime deposit also reduces nozzle efficiency.

7. There are insufficient or inadequate hot water facilities and lack of a proper booster heater, on the rinse water particularly.

8. Automatic detergent feeding devices frequently do not function properly either because they are not refilled when empty or because they have become clogged.

Defects similar to these have been reported by Andrews.<sup>8</sup>

#### CAUSES OF POOR HAND WASHING

The inferior quality of results obtained by the hand washing process, particularly as regards glasses and crockery, is not at all surprising when viewed in the light of field observations. This, perhaps, can best be illustrated by citation of some instances of poor practice. Thus, it was found that the common two compartment sink is very frequently not used in the intended manner. It is quite obvious that the second or rinsing and sterilizing compartment is either improperly used or not used at all. In the case of the three compartment sink, it was often found that the third or sterilizing compartment is not used as such but as a pot washing or glass washing sink. It was observed, likewise, that the sterilizing facility of the two compartment sink with an adjacent sterilizer often is used exclusively for the washing of silverware. Bars, it was found, usually have a two compartment sink with an adjacent sterilizer. The sterilizer as a rule is not used or else appears to be in

poor condition. Frequently, one of the two sink compartments is used to store bottled soda and ice cubes while the remaining one is used to wash glasses by merely plunging them into water, usually in the absence of soap or other detergent. Occasionally, an inverted brush is used. Detergent is usually employed once or twice a day after the glasses have become obviously dirty and sticky. This condition applies to the so-called better type as well as to the run-of-the-mill establishment.

There are several reasons why this improper or non-use of existing hand washing facilities is a very difficult practice to alter. Perhaps, the most important factor is the frequently itinerant status of dishwashing personnel, since dishwashing is usually not a permanent profession. Should the proprietor actually desire to do a good job, which is not always the case, he would have great difficulty because of the lack of understanding of proper dishwashing technic by his personnel and their aforementioned transient status. Another complicating factor is the normal occurrence of rush periods in restaurants when often, because of insufficient stock on hand, there is a greater demand for than supply of clean utensils. This condition frequently gives rise to a quick and careless cleaning operation with the occasional by-passing of the rinsing or sterilization operation or both.

Finally, it would appear that a much more extensive inspectorial supervision will be needed to police hand washing operations properly. In fact, the task of satisfactorily supervising the hand washing process in the approximately 15,000 restaurants in New York City which are estimated to be using it appears to be a well nigh impossible one.

#### RECOMMENDATIONS

It is the considered belief of the present authors, as a result of the foregoing observations on hand dishwashing,

that no great improvement in the quality of washed utensils will be obtained until a large majority of eating establishments have efficient mechanical or combination manual-mechanical utensil washing devices.

It is realized that this conclusion although logical is unquestionably radical, and also difficult to implement immediately. But as part of a long-range program, it seems both sound and feasible.

Assuming the validity of this conclusion that universal mechanical washing of dishes is necessary—how may it be implemented? There are two possible complementary approaches.

One would consist of investigations to correct existing defects in mechanical equipment. In many cases existing equipment can produce satisfactory results—if some alterations are made—or if it is used intelligently. In this connection, the existence of adequate hot water facilities for each type of machine is an important factor. It is almost needless to add that alert restaurant management is almost always ready to cooperate in such endeavors.

The second approach would be made via the permit system. Health departments in most cities require restaurants to obtain permits in order to operate. In the great majority of instances no attempt or only a minimal one is made to regulate the physical structure or other facilities of the restaurant when a permit is issued. If this practice were changed so that plans were submitted before any construction, installation, or alterations were undertaken, a health department could insist upon the provision of sufficient space, ample hot water supply, and other adequate facilities for the washing of dishes.

When a permit is first granted or an important alteration is to be made in an eating establishment the number of meals that can be served at peak periods based on the number of seats

available and the expected turnover time would be determined. This figure would indicate the number of eating utensils of the several kinds needed and the types and capacity of dishwashing equipment required to handle this maximum load. Presence of a sufficient quantity of dishes and silverware and of good dishwashing equipment of adequate capacity would eliminate or mitigate the rushing of the dishwashing operation during busy periods. The capacity of the hot water system, both as to temperature and volume, would also be determined as would the type of detergent and detergent dispenser to be used. Finally the number of persons needed to operate properly and supervise the dishwashing equipment would be established.

#### SUMMARY

A survey of dishwashing practice and performance was carried out in 1,005 restaurants in New York City. It was found that about 88 per cent of establishments used hand methods either entirely or in part and that 17.5 per cent used machine methods entirely or in part.

The quality of washing as measured by the swab-rinse test was found in general to be very poor. Evidence is presented which indicates that unsatisfactory conditions are not peculiar to New York but also exist in other sections of the country.

Hand washed glasses and cups met the bacterial standard of no more than 100 colonies per utensil in 10.5 per cent of instances (176 of 1,675 samples), whereas the analogous figure for the same utensils washed by machine was 35.8 per cent (509 of 1,421). This difference is a very significant one and in favor of machines. Yet it is evident that, since only about two-fifths of machine washed samples passed, much improvement is needed both in the design and in the operation of machines.

Hand washed spoons and forks were found to pass 35.8 per cent of instances (509 of 1,421). This percentage is higher than that for hand washed cups and glasses and is equal to that for machine washed spoons and forks, 35.4 per cent (89 of 251). It was observed that only about 5 per cent of silverware samples which were washed by hand came from establishments which actually made a serious attempt to sanitize these utensils properly. It is noteworthy that the findings with this small group of samples were about 50 per cent better than those from the remaining 96 per cent of samples, which came from establishments in which less care is exercised. Another small group of samples which had been washed by a special silverware machine yielded a passing percentage which was about twice as good as the general average for machine washing.

When the three main types of restaurants studied were compared, it was noted that both hand and machine washing in cafeterias was generally inferior to that in waiter service restaurants and in luncheonettes.

The obvious defects noted in both hand and machine operations are described in detail.

After evaluation, of the present and possible future status of hand washing, the conclusion seems justified that hope for satisfactory dishwashing practice lies in conversion to machine or manual-mechanical practice and the intelligent operation of this adequate equipment. The broad outlines of a program to implement this conclusion are described.

#### REFERENCES

1. Ordinance and Code—Relating to Eating and Drinking Establishments Recommended by U. S. Public Health Service. *Pub. Health Bull.* 280, 1943.
2. Buchbinder, L., and Mazur, S. Unpublished data
3. Tiedeman, W. D. (Chairman). A Proposed Method for Control of Food Utensil Sanitation. Report of Subcommittee on Standard Methods for the Examination of Dishwashing Devices. *A.J.P.H.*, 34: 255 (Mar.), 1944.
4. Scott, W. J. Survey of Dishwashing Methods in Restaurants in a Number of Connecticut Cities and Towns. *Health Bull.*, Connecticut State Department of Health, Aug., 1943.
5. Tiedeman, W. D. Restaurant Hygiene. *New York State J. Med.*, May 15, 1942.
6. Ward, W. E., and Dack, G. M. Bacteriological Tests on Mechanical Dishwasher for Home Use. *A.J.P.H.*, 29:10 (Oct.), 1939.
7. Fuchs, A. W. Personal Communication.
8. Andrews, J. Methods of Sanitizing Eating and Drinking Utensils. *Pub. Health Rep.*, 59:34, Aug. 25, 1944.

# Critical Study of Machine Dishwashing\*

W. L. MALLMANN, PH.D., F.A.P.H.A., PAUL DEKONING,  
AND LEO ZAIKOWSKI

*Departments of Bacteriology and Public Health, and Mechanical Engineering,  
Michigan State College, East Lansing, Mich.*

THERE is little question that improperly cleaned and sanitized dishes constitute a health hazard. There is no question that used dishes and silverware carry mouth microorganisms. Many mouth bacteria are carried on dishes and silverware. Mallmann and Devereux in 1935<sup>1</sup> examined beverage glasses for the presence of streptococci. In many cases where 5 glasses were examined in a tavern, 3 of the glasses, or 60 per cent, showed the presence of streptococci. Out of 15 glasses examined in one series of tests, 8 carried streptococci and one of these glasses carried hemolytic streptococci. The presence of mouth spirochetes was demonstrated by Lyons<sup>2</sup> who collected swab cultures from 200 used and clean glasses in eight taverns in two cities. In one tavern 8 out of 62 glasses when returned from the table carried *Borrelia vincentii*. In another establishment 3 out of 22 used glasses and 4 out of 20 supposedly washed and sanitized glasses carried this organism.

The fact that used beverage glasses carry streptococci and spirochetes, which are frequently pathogenic, is indicative of the presence of many other pathogenic bacteria and viruses. The washing of contaminated glasses in a com-

mon receptacle means the discharge of these organisms into the wash water and a redistribution of the organisms on all dishes washed in the same water.

Even though pathogenic bacteria and viruses were absent on used dishes and silverware, sanitization would still be necessary to reduce contamination hazards in the preparation and serving of foods. For example, it has always seemed absurd to demand a low count in milk and ice cream and then allow the dispenser to serve these foods in dishes laden with microorganisms.

There are little or no reliable data on the operation of mechanical dishwashers, both as to cleaning and sanitization. This is definitely attested to when codes are found throughout the country requiring 2 to 3 minutes' exposure to water at 170–180° F. for all dish sanitization irrespective of whether the work is done by hand or machine. The U. S. Public Health Service Code<sup>3</sup> states: "Immersion at least 2 minutes in clean hot water at a temperature of, at least, 170° F. or ½ minute in boiling water." This statement applies only to hand-washed dishes. The Code further states: "In dishwashing machines the use of high wash water temperature, higher detergent concentrations, and the more efficient mechanical removal of soil make it possible to employ a shorter exposure period for final treatment."

Much of the confusion is perhaps due to the recognition of only one time and temperature without regard to the

\* Presented before the Engineering Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 12, 1946.

NOTE: These studies were made possible through a grant from the National Sanitation Foundation and a loan of machines from the Dishwashing Machine Manufacturers.

method of procedure. Much confusion is also due to a lack of information upon necessary time and temperature in dishwashing machines. The U. S. Public Health Service Code states: "Additional research on dishwashing machines will be required definitely to establish the necessary wash and rinse temperatures, the minimum washing and rinsing time . . . the optimum concentrations of different detergents and similar factors. However, it seems to be fairly well established that the wash water temperature should be approximately 140° F."

This paper presents, in part, some phases of research in studies in mechanical dishwashing. A complete report will be presented later.\*

#### STUDIES ON TIME AND TEMPERATURE OF RINSE

The first phase of our studies pertained to the time and temperature of rinse in mechanical dishwashing.

To measure the effectiveness of the rinse it was necessary to develop some method of holding test organisms on the test plates during the rinse period. Rinsing washes off most bacteria so that bacterial populations become so low they are insignificant and of no comparative value. Accordingly, the first problem was the development of a soil that would remain intact on the test plates throughout the rinse period and which still could be easily resuspended in sterile saline so that bacterial counts could be made to determine survival numbers. Many soils were tried. The final soil consisted of the following:

- 265 ml. distilled water
- 17 gm. corn starch flour
- 15 ml. test organism suspension  
(standardized by photolometer)
- 10 ml. India ink

The ingredients were placed in a Waring blender and mixed for 2 min. to

produce a well mixed suspension which remained stable during the period of spraying on the test plates. Because it was impossible to sterilize the mixture without destroying its property to adhere to the test plates, the ingredients had to have low bacterial populations.

The soil was sprayed on 9 in. white China dinner plates by a specially devised soiling machine<sup>4</sup> which places a definite quantity of soil on the plates in an even film. The plates were then placed in a drying cabinet at a temperature of 105° F. for 17 hrs. in the presence of calcium chloride.

The test organism for measuring effectiveness of time and temperature of rinse must have a heat-resistance equal to or greater than pathogenic bacteria which might be found on used dishes and silverware. The only established test organism having such resistance is a strain of *Escherichia coli* which has been used extensively for checking pasteurization temperatures. This strain was tested but was found to die rapidly from desiccation during the drying period of fixing the soil to the plates. Furthermore, because it was necessary to use unheated soils and because it was impossible to use aseptic conditions, it was necessary to use a test organism which would be easily identified on the agar plates. *Escherichia coli* could, of course, be readily identified on special diagnostic media but, due to the attenuation of the organisms as a result of desiccation and heating, such selective media would not allow the growth of many viable cells. Strains of *Staphylococcus aureus* were tried but also could not withstand desiccation. A chromogenic coccus, *Micrococcus caseolyticus* was finally selected because it gave a yellow colony on agar and because it withstood desiccation fairly well.

This organism has good heat resistance. Its comparative heat resistance to that of other test organisms is pre-

\* A research bulletin is being prepared. This will be published by the National Sanitation Foundation.

TABLE 1

## Thermal Death Point Determinations Using Organism Coated Glass Rods

Test Organism	Seconds of Exposure	Temperature of Exposure — Degrees Fahrenheit											
		150		152		154		156		158		160	
		10	15	10	15	10	15	10	15	10	15	10	15
<i>M. caseolyticus</i>		+	+	+	+	+	+	+	+	+	—	—	—
<i>E. coli</i> *		+	+	+	+	+	+	+	—	—	—	—	—
<i>S. aureus</i>		+	+	+	+	+	—	—	—	—	—	—	—
<i>Strept. fecalis</i>		+	+	+	+	+	+	+	+	+	—	—	—

\* Resistant strain obtained from U. S. Public Health Service

sented in Table 1. The thermal death points were made by use of the organism-impregnated glass rods, similar to those used in the Use-dilution technic for measuring disinfectants.<sup>5</sup> In this technic glass rods 1 in. long and  $\frac{1}{4}$  in. in diameter, with a small glass loop at one end for handling, are dipped into a 24 hr. broth culture of the organism and allowed to dry on sterile filter paper in Petri dishes. Care must be exercised in placing the rods on the filter paper. Rolling will remove many organisms. The rods are allowed to dry for 30 min. at room temperature to fix the organisms on the glass surface. Sterile water was placed in disinfectant medication pots in 10 ml. quantities. The medication pots were placed in a constant temperature water bath. The glass rods held on a platinum wire were lowered into the water bath for intervals of 10 and 15 sec. and then immediately dropped into 10 ml. F.D.A. broth in test tubes. All tubes were incubated at 37° C. for 48 hrs. *M. caseolyticus* was found to have a thermal death point of 158° F. in 15 sec. *E. coli* had a thermal death point of 156° F. in 15 sec. and *S. aureus*, 154° F. at 15 sec. *S. fecalis* had the same thermal death point as that of *M. caseolyticus*. Dahlberg<sup>6</sup> found the thermal death point of *M. tuberculosis* to be 160° F. at 5 sec. This is comparable to that of *M. caseolyticus*. The stability of *M. caseolyticus* toward heat is shown in Table 2. Over a period of approximately 9 months the heat resistance remained fairly constant.

The data show that this organism can be used as a test organism for measuring heat sanitization.

TABLE 2

The Heat-resistance of *M. caseolyticus* over a Period of 9 Months Tested by Capillary Tube Method of Determining Thermal Death Points Expressed in Degrees F.

Date of Testing	Exposure in Seconds		
	5	10	15
Dec. 7, 1945	—	156°	154°
Feb. 26, 1946	—	158°	156°
April 9, 1946	—	158°	156°
Sept. 7, 1946	160°	156°	154°
Sept. 22, 1946	158°	156°	154°

The thermal death point determinations, using either the capillary tube or the Use-dilution rod method, are made on unprotected cells, that is, cells which are not surrounded by a protective coating of foreign material. In the tests made in the dishwashing machines the organisms are purposely covered with a protective coating of corn starch to hold them on the test plate during the period of the rinse. Some organisms on the surface of the film coating are lost by mechanical removal but most of them are retained. To check the effect of the film-coating on the cells, microscope slides were sprayed with the soil containing *M. caseolyticus* on one side in the same manner as the test plates. The slides were then dried at 105° F. for 17 hrs., when they were dipped into a constant temperature water bath at temperatures of 130°, 150°, and 170° F. for intervals of 10, 20, 30, and 40

sec. After exposure, the film-coating was removed with a sterile swab and the material was suspended in sterile saline and plated on tryptose glucose extract agar. After 48 hrs. incubation the number of viable organisms on each slide was determined. The data are presented in Table 3. It will be observed that complete kill was not obtained in 10 sec. exposure at 170° F. When the organisms were checked with the Use-dilution rod method, complete kill was obtained at 160° F. in 10 sec. This shows that the film-coating protected the organism to a marked degree against the lethal action of the heat. It will be observed, however, that the percentage reduction was 97.9 at 170° F. in 10 sec. The 10 degree increase in temperature over that of the glass slide method thus serves as a safety factor in the calculation of proper time and temperature of the rinse so that there is full assurance that a 99 per cent kill in the rinse chamber of the dishwashing machine can be accepted as an index of public health safety. Furthermore the fact that 99 per cent can be killed at a given time and temperature is an assurance that bacteria would be killed even though a dish were not thoroughly washed.

dishes could be washed in one and rinsed in the other.

Controls were placed on hot water lines in such a manner that constant temperature could be delivered to the machine throughout the experiments. Recording thermometers were used so that a record was kept of the temperature during each experiment. Timing was done by stopwatch control. Flow pressures of the water were held constant so that rinse action would be as nearly comparable as possible for all machines.

In testing each machine, test plates were arranged in the wash racks with two plates in the front row, labelled No. 1 in front-right and No. 2 in left front position. Two plates were placed in the center of the rack, labelled No. 3—front center and No. 4—back center. Two plates were placed in the back row, labelled No. 5—back left and No. 6—back right. In the studies presented, all plates were slanted with the face up. This was done to avoid soil removal patterns caused by interference from the support rods in the rack.

The results obtained at 170° F. for 5 and 10 sec. intervals of exposure are presented in Table 4. The average percentage kill at 5 sec. exposure for all

TABLE 3  
*The Survival of M. caseolyticus Impregnated in Test Soil on Glass Slides to Moist Heat*

Temperature of Exposure	Number of Surviving Bacteria							
	Time of Exposure in Seconds							
	10		20		30		40	
	Count	Per cent Reduction	Count	Per cent Reduction	Count	Per cent Reduction	Count	Per cent Reduction
130° F.	72,000	28.0	53,000	47	43,000	57	25,000	75
150° F.	37,000	63.0	26,000	74	11,000	89	6,000	94
170° F.	2,100	97.9	0	100	0	100	0	100
Control	100,000							

The studies on dishwashing machines were made on manufacturers' models. The machines used were all single tank hand operated machines. Two machines of each manufacturer were placed in tandem with a table between so that

machines was 92.17, and the range among the machines was from 88.55 to 98.80. With a 10 sec. exposure a percentage kill of 99.51 was obtained with a range among the machines from 99.11 to 99.81. The data from one machine

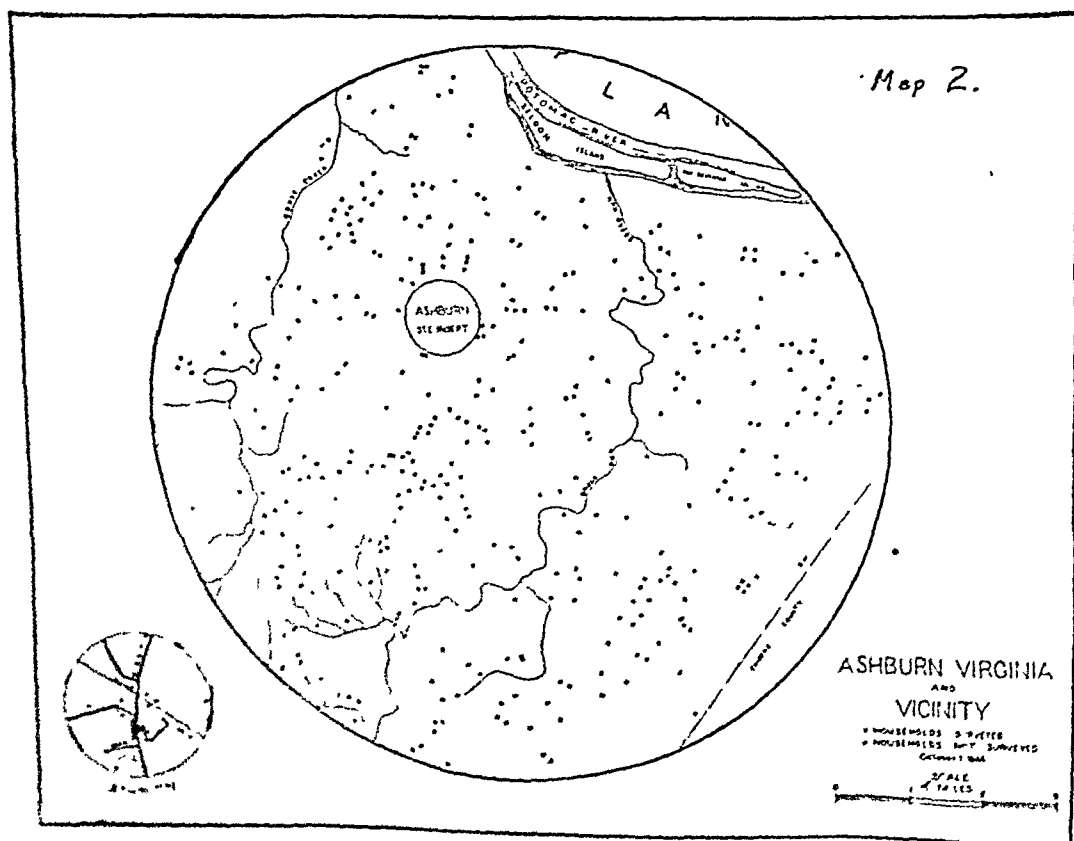


the sire of 8 pups born in January, 1945. The 2 year old mate has remained healthy. Two female pups of this litter were destroyed at birth; one male died when 1 week old of unknown cause; one female was healthy when destroyed in February, 1946, after giving birth to 9 pups, only one of which has been ill, and careful examination has produced no evidence of histoplasmosis; one male of the original litter died in April, 1946, with symptoms suggestive of histoplasmosis; 2 females died in May, one with proved histoplasmosis and the other with suspicious symptoms; and one male died on July 19 with proved histoplasmosis. This animal was referred for study to Dr. M. Parsons of Arlington, Va. The two dogs dying with symptoms suggestive of histoplasmosis had anorexia and emaciation; no definite diagnosis was established as no material was available for examination. In the three dogs dying

of proved histoplasmosis the diagnosis was established by recovery of *Histoplasma capsulatum* from cultures of the spleen and other organs.

The case of the male dog dying of histoplasmosis on July 19 will be the subject of a later report, but a few notes will be included here. Ticks, *Dermacentor variabilis*, were fed on the dog during illness and *Histoplasma capsulatum* was recovered by culture from a ground-up tick soon after feeding. This was not surprising inasmuch as repeated blood cultures showed a heavy infection. Further studies of the relation of ticks to histoplasmosis are under way. On July 2 and again on July 10, two pairs of healthy dogs were placed and remained in continuous contact in the same cage with the naturally infected dog dying on July 19. None of these four contacts has shown any evidence of histoplasmosis to date.

Map 1 shows the location of the two



country estates where the infected dogs were kept. They were valuable dogs which were carefully fed and cared for. They were not used for hunting. There were 11 other dogs on one estate, 5 old coon hounds and 6 pups; all have remained well except two which were studied without evidence of histoplasmosis being found. Only one person was found on these estates with an illness suggestive of histoplasmosis; thorough hospital study gave no evidence of *Histoplasma* infection. No evidence of any contact whatsoever could be found between proved canine and human cases of histoplasmosis.

The household studies and physicians' reports yielded several cases of illness in which clinical and laboratory studies produced various diagnoses but no evidence of histoplasmosis. To date,

476 white persons in the vicinity of Ashburn have been satisfactorily x-rayed and skin-tested with histoplasmin and tuberculin (PPD), and their medical histories have been completed. Map 2 shows the geographic distribution of households studied.

Table 2 shows the number of persons having (A) calcified pulmonary lesions, (B) positive skin reactions with histoplasmin, and (C) positive skin reactions with tuberculin (PPD). The histoplasmin reactions are those of initial clinic visits; retests are described later. A tabulation similar to Table 2 has been made showing the presence or absence of calcified pulmonary lesions and the reactions to histoplasmin and tuberculin according to the medical histories of persons tested with respect to pertussis, diphtheria, scarlet fever, pneu-

TABLE 2

*Number and Per cent of White Persons Having Pulmonary Calcification and Positive Skin Reaction to Histoplasmin and Tuberculin (PPD) According to Specified Attributes*

Attributes		Total Number of Persons	A Persons with Calcified Pulmonary Lesions			B Persons with Positive Histoplasmin Reaction			C Persons with Positive Tuberculin (PPD) Reaction		
			"P" in			"P" in			"P" in		
			No.	Per cent	1,000	No.	Per cent	1,000	No.	Per cent	1,000
Age	1- 5	476	196	41.2		393	82.6		114	24.4	
	6- 9	32	3	9		15	47		1	3	
	10-14	94	41	44		76	81		4	4	
	15-39	121	54	45	6	99	82	<1	17	14	<1
	>39	148	64	43		136	92		45	30	
		81	34	42		67	83		47	58	
Sex	Male	239	95	40		204	85		76	32	
	Female	237	101	43	>300	189	80	107	38	16	<1
Years residence in Loudoun County	0- 2	75	20	27		47	63		16	21	
	>2	401	176	44	5	346	86	<1	98	24	>300
Tuberculin Skin Reaction	Pos.	114	53	47		102	89				
	Neg.	362	143	40	186	291	80	26			
Histoplasmin Skin Reaction	Pos.	393	170	43							
	Neg.	83	26	31	45						
History of Tuberculosis or in Household with Tuberculosis	Yes.	28	20	71		24	86		8	29	
	No	448	176	39	<1	369	82	>300	106	24	>300

"P" = The probability that differences in percentages as great or greater than shown would occur in independent attributes through chance sampling variation.

monia, illness with diarrhea, ascariasis, and malaria. This tabulation shows no significant association between these diseases and pulmonary calcification, and no association with the histoplasmin or tuberculin skin reaction.

Column A of Table 2 shows that 41.2 per cent of the group studied had calcified pulmonary lesions. This was relatively constant in all age groups except 1-5 years where, as expected, it is lower. It is significant that recent residents of Loudoun County are not as apt to have calcified pulmonary lesions as residents of 3 years or longer. Also, individuals with a history of tuberculosis or of having lived in the same household as a person with a history of tuberculosis appear more apt to have calcified pulmonary lesions than individuals without this history. Column A shows no significant association between pulmonary calcification and either sex or the tuberculin reaction.

In the area studied it was impossible to demonstrate any direct association between the occurrence of pulmonary calcification and positive histoplasmin skin reactions. From the crude data in column A one might suspect that if a larger sample were taken a significant association would have been shown. Therefore, the following analysis of the data seems pertinent particularly in view of the association between these attributes reported in other areas.<sup>1-3, 7</sup> The number of persons having pulmonary calcification according to the histoplasmin and tuberculin skin reactions were:

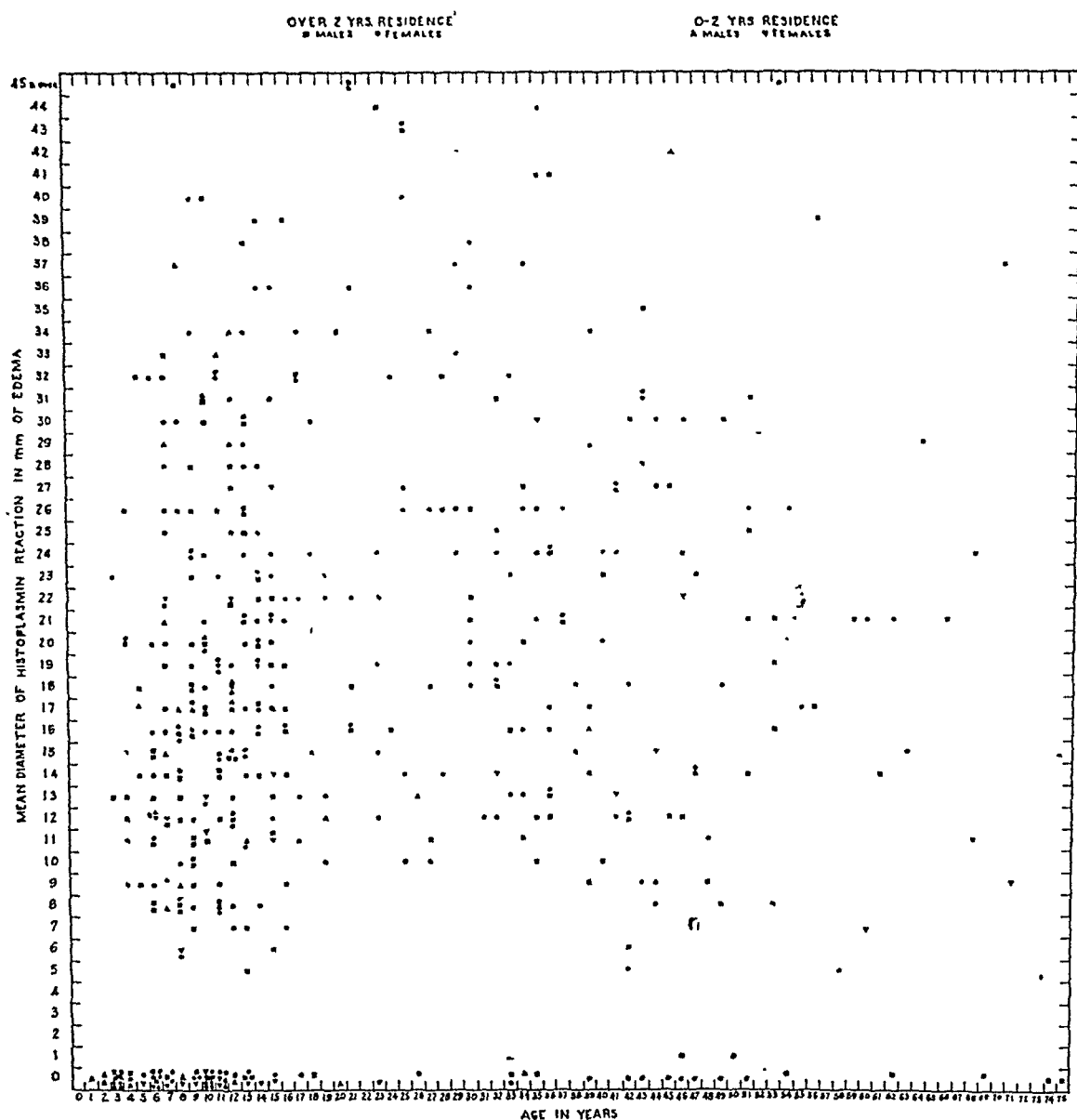
		Per cent
Histoplasmin-positive	Tuberculin-positive	48/102 47
Histoplasmin-positive	Tuberculin-negative	122/291 42
Histoplasmin-negative	Tuberculin-positive	5/12 42
Histoplasmin-negative	Tuberculin-negative	21/71 30
Total		166/476 41

The differences in the above percentages might well be expected by chance sampling variation alone. This suggests that the small difference shown in column A was not due to direct association between the histoplasmin reaction and pulmonary calcification. Thus among the group having pulmonary calcification a comparison of persons positive to both histoplasmin and tuberculin with persons negative to histoplasmin and tuberculin showed that the former included a disproportionate excess of persons who were in the older age group, who resided in Loudoun County 3 years or longer, and who had a history of either having tuberculosis or living in a household with a person with tuberculosis. These three attributes were definitely associated with the occurrence of pulmonary calcification; the first two were associated with the occurrence of positive histoplasmin reactions, and all were associated in the direction that could produce differences similar to those shown above in the percentage of persons with calcified pulmonary lesions, but independent of the histoplasmin reaction. Hence it would appear unlikely that a larger sample, taken from this area where recent, proved cases of human histoplasmosis occurred, would demonstrate any direct association between the occurrence of pulmonary calcification and positive histoplasmin skin reactions.

Column B of Table 2 shows that 82.6 per cent of the group had a positive reaction to the histoplasmin skin test. The incidence of positive reactors is high in all age groups, being 47 per cent in the group 1-5 years old and more than 80 per cent in the older age groups. As with pulmonary calcification, recent residents of Loudoun County are not as apt to have a positive histoplasmin reaction as residents of 3 years or longer. There may be some association between persons reacting to the histo-

CHART 1  
SIZE OF HISTOPLASMIN REACTION ACCORDING TO AGE, SEX,  
AND RESIDENCE IN LOUDOUN COUNTY

INITIAL SKIN TEST IN 476 WHITE PERSONS



plasmin test and those reacting to the tuberculin test. As with pulmonary calcification, the histoplasmin reaction was not significantly associated with sex.

Column C shows that 24.4 per cent of the group gave a positive reaction to the tuberculin (PPD) test. There is a progressive increase with age in the proportion of persons reacting to tuberculin, and males were more apt to be positive reactors than females, other-

wise no significant association was found except as mentioned above.

Chart 1 shows the relation between the size of the histoplasmin reaction and age. The chart was prepared to determine whether it would indicate a better criterion for classifying histoplasmin reactions as positive (5 mm. or more diameter of edema was classified as positive). No better criterion was evident.

Three to 8 months after initial test,

40 persons with negative initial histoplasmin skin tests were retested, again x-rayed, and their medical histories including an interim history were carefully checked and studied. Fifty-eight persons with positive initial histoplasmin tests were likewise retested, again x-rayed, and studied medically. Of the 58 persons initially histoplasmin-positive, 24 (41 per cent) had pulmonary calcification; on retest 54 (93 per cent) remained histoplasmin-positive, and of these, 24 (44 per cent) had pulmonary calcification. Of the 40 initially histoplasmin-negative, 20 (50 per cent) had pulmonary calcification; on retest 22 (55 per cent) became histoplasmin-positive, and of these, 9 (41 per cent) had pulmonary calcification. The serial x-ray films of all individuals retested were carefully studied and not a single change was detected between initial and last test. From the medical interviews no evidence of illness could be elicited that could be associated with a change in the histoplasmin skin reaction.

#### SUMMARY AND CONCLUSIONS

In September, 1945, when the fourth human case of histoplasmosis (all fatal) was recognized among the 20,000 population of Loudoun County, Virginia, the authors began an intensive search for evidence of infection in man and animals. Local physicians, nurses, veterinarians, and others were interested in the problem and they reported cases of suspicious illness in man and animals to the authors for clinical, mycological, and pathological study.

Eight hundred and eighty-six animals have been captured and studied, and among these, only one rodent (*Mus musculus*) and one dog have been found naturally infected with histoplasmosis. Two other dogs of the same kennel have been found naturally infected in Loudoun County and reported.<sup>12</sup>

All infected dogs were associated

with each other and the infected rodent was captured in the basement of the home where the dogs which were later proved infected had been kept some 19 months previously. The animal and human cases were distant from each other and no contact between them could be established.

Some 500 persons residing in the area where recent proved infection with *Histoplasma* has occurred, have been studied and to date no evidence of human infection was found. Of the 476 white persons surveyed, 83 per cent had a positive histoplasmin skin reaction at initial test, and 41 per cent had calcified pulmonary lesions. Persons who were histoplasmin-positive were older and had resided in Loudoun County longer than persons who were negative. Persons who had calcified pulmonary lesions were older, had resided in Loudoun County longer, and were more apt to have a history of tuberculosis or to have household association with a person having a history of tuberculosis than persons with no calcified pulmonary lesions. No direct association could be established between the occurrence of positive histoplasmin skin reactions and pulmonary calcifications.

Forty persons initially histoplasmin-negative and 58 persons initially histoplasmin-positive were retested 3 to 8 months after initial test. On retest 7 per cent of the positives became negative, but 55 per cent of the negatives became positive. In all, the individual serial chest x-rays showed no change, and repeated medical studies gave no evidence of any suspicious illness either prior to or during the period of change in skin reaction.

To date no evidence of mild human histoplasmosis has been found in Loudoun County, Va.

**ACKNOWLEDGMENT:** This study was made possible through the complete coöperation of the people of Loudoun County. Mrs. Tillie Monroe, principal of the Ashburn School, the

Parent-Teacher Association, and other citizens of the community have facilitated the study in every possible way. The physicians of Loudoun County, especially Drs. J. A. Gibson, J. T. Jackson, and G. H. Musgrave, have given every assistance. The Virginia State Health Department and the Loudoun County Health Department coöperated in the study and furnished nurses, technicians, and x-ray equipment for the clinics.

REFERENCES

1. Christie, Amos, and Peterson, J. C. Pulmonary Calcification in Negative Reactors to Tuberculin. *A.J.P.H.*, 35:1131 (Nov.), 1945.  
2. Palmer, Carroll E. Nontuberculous Pulmonary Calcification and Sensitivity to Histoplasmin. *Pub. Health Rep.*, 60:513 (May 11), 1945.  
3. Palmer, Carroll E. Geographic Differences in Sensitivity to Histoplasmin among Student Nurses. *Pub. Health Rep.*, 61:475 (Apr. 5), 1946.  
4. Gass, R. S., Gauld, R. L., Harrison, E. F., Stewart, H. C., and Williams, W. C. Tuberculosis Studies in Tennessee. Roentgenological Evidence of Tuberculosis Infection in Relation to the Tuberculin Sensitivity in School Children. *Am. Rev. Tuberc.*, 38:441 (Oct.), 1938.  
5. Lumsden, L. L., and Dearing, W. P. Epidemiological Studies of Tuberculosis. *A.J.P.H.*, 30:219 (Mar.), 1940.  
6. Olson, B. J., Wright, W. H., and Nolan, M. O. An Epidemiological Study of Calcified Pulmonary Lesions in an Ohio County. *Pub. Health Rep.*, 56: 2105 (Oct. 31), 1941.

7. Furculow, Michael L., High, Robert H., and Allen, Margaret. Some Epidemiological Aspects of Sensitivity to Histoplasmin and Tuberculin. *Pub. Health Rep.*, 61:1132 (Aug. 2), 1946.  
8. McLeod, John H., Emmons, Chester W., Ross, Sidney, and Burke, F. G. Histoplasmosis—A Report of Four Cases, Two in Siblings. Histoplasmin Test and Other Diagnostic Procedures. *J. Pediat.*, 28:275 (Mar.), 1946.  
9. Emmons, C. W., Olson, B. J., and Eldridge, W. W. Studies of the Role of Fungi in Pulmonary Disease. I. Cross Reactions of Histoplasmin. *Pub. Health Rep.*, 60:1383 (Nov. 23), 1945.  
10. Seibold, H. R. A Case of Histoplasmosis in a Dog. *J. Am. Vet. M. A.*, 109:209 (Sept.), 1946.  
11. DeMonbreun, W. A. The Dog as a Natural Host for *Histoplasma capsulatum*. *Am. J. Trop. Med.*, 19:565, 1939.  
12. Thuringer, Joseph M. Histoplasmosis: Report of Its Occurrence in a Dog. *Arch. Path.*, 37:140 (Feb.), 1944.  
13. Callahan, W. P. J. Spontaneous Histoplasmosis Occurring in a Dog. *Am. J. Trop. Med.*, 24:363 (Nov.), 1944.  
14. Birge, R. F., and Riser, Wayne H. Canine Histoplasmosis. Report of Two Cases. *North Am. Vet.*, 26:281 (May), 1945.  
15. Para, Madureira. Histoplasmosis in Brazil. *Am. J. Trop. Med.*, 26:273 (May), 1946.  
16. Tomlinson, Wray J., and Grocott, Robert G. Canine Histoplasmosis. A Pathologic Study of the Three Reported Cases and the First Case Found in the Canal Zone. *Am. J. Clin. Path.*, 15:501 (Nov.), 1945.  
17. Parsons, Robert J., and Zarafonitis, C. J. D. Histoplasmosis in Man. Report of Seven Cases and a Review of Seventy-one Cases. *Arch. Int. Med.*, 75:1 (Jan.), 1945.

Best Sellers in the Book Service for March

The Control of Communicable Diseases. American Public Health Association. 6th ed. (1945) .....	\$ .35
Dairy Bacteriology and Public Health. C. S. Bryan. (1945).....	1.00
Diagnostic Procedures and Reagents. American Public Health Association. 2nd ed. (1945) .....	4.00
The Health of the School Child. Gertrude E. Cromwell. (1946).....	2.50
Local Health Units for the Nation. Emerson & Luginbuhl. (1945).....	1.25
Modern Attack on Tuberculosis. Chadwick & Pope. 2nd ed. (1946).....	1.00
The Public Health Nurse in the Community. Clara B. Rue. (1944).....	2.50
Public Health—A Career with a Future. American Public Health Association. (1946)..	.10
Standard Methods for the Examination of Dairy Products. American Public Health Association. 8th ed. (1941).....paper	2.00
Standard Methods for the Examination of Water and Sewage. American Public Health Association. 9th ed. (1946).....	4.00
Swimming Pool Data and Reference Annual. Beach & Pool, Inc., 14th ed. (1946)....	3.00

Order from the Book Service  
AMERICAN PUBLIC HEALTH ASSOCIATION

# American Journal of Public Health

## and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 37

April, 1947

Number 4

### Editorial Board

REGINALD M. ATWATER, M.D.  
*Chairman and Managing Editor*

LEONA BAUMGARTNER, M.D.  
MARTIN FRORISHER, JR., D.Sc.  
PROFESSOR JOHN M. HENDERSON

RALPH S. MUCKENFUSS, M.D.  
STUART MUDD, M.D.  
RAYMOND S. PATTERSON, Ph.D.

C.-E. A. WINSLOW, Dr.P.H.

C.-E. A. WINSLOW, Dr.P.H., *Editor*

AUGUSTA JAY, *Editorial Associate*

## THE CONTROL OF AIR-BORNE INFECTIONS

WHEN any new procedures are introduced in public health, we must expect a swing of the pendulum between extremes of enthusiastic acceptance and of cautious negation. Recent suggestions with regard to the disinfection of air by ultra-violet irradiation or by the use of aerosols and the reduction of atmospheric pollution by control of dust form no exception to the rule.

Since the subject was discussed in these columns on an earlier occasion,<sup>1</sup> the pendulum has been swinging toward the side of a not unwholesome scepticism, as presented in two reports published in an earlier number of this JOURNAL. With the Special Review Article, which opens the present issue, the time seems ripe for a review of recent trends of thinking in Aero-Epidemiology.

The first of the articles in question was the Report of the Subcommittee for the Evaluation of the Control of Air-borne Infections of our Association Committee on Research and Standards, under the chairmanship of J. E. Perkins.<sup>2</sup> This report deals particularly with the control of the spread of disease by droplet nuclei and air-borne dust, considering "droplets," as distinct from "droplet nuclei," to be a form of direct contact infection. It points out that the value of control of secondary infections by irradiation in operating rooms has been impressively demonstrated; that striking results have been reported as to control of communicable diseases in contagious pavilions and pediatric wards; that irradiation of the upper air of schoolrooms in Swarthmore and Germantown, Pa., apparently controlled two epidemics of measles and showed beneficial results in a epidemic of chicken pox. Mumps, which prevailed at a time when relatively high humidity existed (under which conditions ultra-violet light is least efficient) showed less clear results. At Camp Sampson, a group of naval personnel protected by irradiation showed a 25 per cent lower incidence of "respiratory admissions" than did a control group. There seems no reason to doubt that the use of glycol vapors, in aerosol form, might produce similar results; but no similar controlled epidemiological investigations have been made with these disinfectants.

The major conclusions of this report may be summarized as follows:

"The oiling of floors, blankets, and bedding has now developed to the point of practical application in the suppression of dust. Such measures constitute good

housekeeping. They reduce bacterial contamination of the air, but there is as yet insufficient evidence that they prevent disease.

"The available evidence strongly indicates that methods of air disinfection (ventilation, ultra-violet irradiation, and glycol vapors) are useful adjuvants to aseptic techniques in the reduction or elimination of air-borne infections in operating rooms and in contagious disease and pediatric wards.

"The general use of ultra-violet irradiation or disinfectant vapors in schools, barracks, and in specialized industrial environments is not justified at the present time. There is great need for further carefully controlled field studies to define the mechanisms of the spread of infectious disease among these types of populations.

"There is no justification for the indiscriminate use of ultra-violet light or other methods for disinfecting air in homes, offices, or places of public congregation."

A second important review was presented by the Committee on Sanitary Engineering of the National Research Council under the chairmanship of Abel Wolman.<sup>3</sup> This report first discussed somewhat inconclusive results on dust suppression by oiling at Fort Bragg and elsewhere; and much more striking results obtained in the British and Canadian armies. The British studies showed a rate for respiratory disease incidence of 7 per 1,000 in barracks where the floors were oiled as compared with a control figure of 38 per 1,000; and the Canadian data led to the mandatory oiling of floors in all Canadian army buildings. So far as irradiation is concerned, the Camp Sampson results are cited in some detail. In all these experiments, laboratory tests and tests for beta-hemolytic streptococci showed a marked decrease in air contamination. With regard to disinfection by the use of glycol vapors, similar reductions in bacterial content have been reported; but data on actual decrease of disease by this procedure in American and Canadian barracks and at the Lockheed Air-Craft plant were much less significant than in the case of irradiation. The committee concludes that "the oiling of floors and blankets and, in hospital wards, of sheets and pillow cases, has been shown to be a practical, cheap, and effective measure"; and feels that this procedure should be employed either with or without means for air disinfection. As to disinfection by irradiation or by glycol vapors, it is concluded that these procedures "may have a measurable effect upon the attack rate from certain respiratory diseases, but experience is not sufficient to justify drawing definite conclusions." The committee, therefore, "does not recommend the general use of these disinfecting devices for the present. Much research and development work by qualified persons remains to be done."

All observers seem to be agreed on the value of dust suppression in such places as barracks and hospitals. As to the relative importance of air-borne dust as compared with droplet nuclei it is of interest to note that Hare and Mackenzie from Toronto<sup>4</sup> have recently stressed the former, although their arguments do not seem too convincing. Oiling is, however, a cheap and easy procedure and requires none of the special precautions involved in air disinfection. The details of this procedure are discussed by C. G. Loosli in our Special Review Article this month.<sup>5</sup> He cites certain of the studies discussed in the reports already reviewed, and particularly the very striking results obtained in a British measles ward where cross-infection rates (using Group 1, type 6 streptococci as an index) were cut from 73 per cent to 19 per cent and complication rates from 14 per cent to 3 per cent by oiling floors, bed clothes, garments, and all other cotton and woolen



fabrics. The oiling technique (for hospitals and barracks) may be considered to have "arrived."

Air disinfection may also be considered to have "arrived" as a procedure which is certainly advisable in the operating room and highly desirable in the contagious disease pavilion and the pediatric ward. Its extension beyond this point is, at present, still problematical; and nothing could do more to prejudice sound progress than commercial over-exploitation of such procedures. Dr. R. E. Dyer, Director of the National Institute of Health issued on January 5, 1947, a salutary warning in this regard. He said, "During the past few months, several articles have appeared in the public press relative to the possible efficacy of glycol vapors and ultra-violet radiation in reducing certain infectious diseases, particularly upper respiratory diseases, such as the common cold. Due to the fact that many inquiries have been made as to the possibility of using one or both of these methods in public buildings, it is felt that a statement at this time should be made concerning the use of such installations.

"Committees of the National Research Council and the American Public Health Association have studied and reviewed the data on such installations. Within the past several weeks, these two committees separately have submitted reports. Both of these committees feel that the use of either glycol vapors or ultra-violet radiation is still purely in the experimental state and that the data collected so far do not warrant the installation of such equipment in public buildings and industry in the hope of cutting down upper respiratory infection. The U. S. Public Health Service, through its research organization, the National Institute of Health, has conducted rather extensive studies on both glycol vapors and ultra-violet radiation and fully concurs in the reports and recommendations made by the committees of the National Research Council and the American Public Health Association. It must be emphasized that direct unshielded ultra-violet radiation of sufficient intensity to kill microorganisms in the air is also harmful to the eyes and exposed skin of humans. These observations are not intended to indicate that the future will or will not disclose new public health values in the application of either glycols or ultra-violet radiation. Much experimentation is needed, however, before a decision can be made as to whether such application may or may not be warranted."

It is not to be assumed that recent studies have in any sense negated the value of air disinfection. They have merely emphasized the importance of caution in urging processes whose real field of usefulness has yet to be determined. That these procedures do reduce the microbic content of the air is certain; and they can be utilized, with appropriate precautions, without danger. As Loosli concludes, "the magnitude of the problem of the control of air- and dust-borne diseases has been emphasized recently by Mudd.<sup>6</sup> The employment of these dust-laying procedures in conjunction with other methods of air disinfection, such as glycol vapors, ultra-violet light, and adequate ventilation, offer the best opportunity for their control."

The problem is a quantitative one. "How great a reduction in disease incidence may a given procedure, applied in a given indoor space be expected to produce?" It should be remembered that even a small percentage reduction may be of major importance, if the percentage is applied to a high initial incidence. A 25 per cent reduction in the incidence of common colds would mean more for the public health than a 90 per cent reduction in the incidence of measles or mumps.

The answer to this question will obviously vary with the kind of space in which air disinfection is applied. In the hospital ward, air disinfection affects the patient for 24 hours a day and other sources of possible infection are reduced to a very minor hazard. Here, the case is reasonably clear.

A second group of problems is presented by the barracks and the school. In barracks we have close aggregation of large numbers for most of the indoor life of the individual; in schools and in certain industrial establishments, the same condition obtains for a more limited time period. It is significant to note that Wells's early studies in the schools near Philadelphia showed good results in measles and chicken pox (spread chiefly from child to child) but not for the common cold (where spread among the adults in the community plays so large a part in transmitting disease to children as to swamp any beneficial result of schoolroom disinfection). One might differ from Perkins's committee which apparently drops places of public assemblage from the intermediate class to those where there is no reasonable possibility of a useful application. (He is safeguarded by the term "indiscriminate"; since there is no value in "indiscriminate use" of any procedure anywhere.) The very close aggregation of a very large number of persons—even for a short space of time—may be a significant health hazard. On the other hand, we must agree with the Perkins committee in excluding the disinfection of air in homes and offices (except perhaps large and crowded offices) from the area of probable, or even possible usefulness. Aggregations are commonly so slight and other opportunities of infection so great in the home and the office as to make fruitful results most improbable.

The barracks, the school, the large industrial shop, and the large office seem to offer the area of greatest possible promise. It is here that we need serious and well controlled and long-continued experimental study, such as is now being conducted in schools in New York State and elsewhere; and a preliminary report from New York will be published in the May issue of this JOURNAL.

We should be cautious and critical, as Dr. Dyer has emphasized; but we should also be patient and open-minded. The upper respiratory infections constitute our major problem of communicable disease control in the Temperate Zone; and any procedure which can affect their incidence would represent a significant advance in public health.

#### REFERENCES

1. Editorial, *A.J.P.H.*, 35:951 (Sept.), 1945.
2. The Present Status of the Control of Air-borne Infections. Report of the Subcommittee for the Evaluation of Methods to Control Air-borne Infections of the Committee on Research and Standards. *A.J.P.H.*, 37:13 (Jan.), 1947.
3. Recent Studies on Disinfection of Air in Military Establishments. Report of the Committee on Sanitary Engineering, National Research Council. *A.J.P.H.*, 37:189 (Feb.), 1947.
4. Hare, R., and Mackenzie, D. M. The Source and Transmission of Nasopharyngeal Infections Due to Certain Bacteria and Viruses. *Brit. M. J.*, 1:865 (June 8), 1946.
5. Loosli, C. G. Dust and Its Control as a Means of Disinfection of Air. *A.J.P.H.* (this issue).
6. Mudd, S. Air-borne Infection. The Rationale and Means of Disinfection of Air. *Bull. New York Acad. Med.*, 21:393, 1945.

## A CABINET POST OF HEALTH, EDUCATION AND SECURITY

THE introduction into the Congress by Senators Fulbright and Taft and Representative Harris of a bill for the establishment of a new executive department of the federal government to cover the fields of Health, Education and Security

promises to be an important milestone in the history of public health in the United States.

For nearly a century and a half our national health service was under the Secretary of the Treasury—a historical accident due to the fact that this branch of our government was originally the Marine Hospital Service, established to provide funds for hospital care for sick sailors stranded in strange ports. As the scope of its work enlarged, it became the "Public Health and Marine Hospital Service" and the "United States Public Health Service," but still remained under the Treasury. The plan actually worked well, since the Secretary of the Treasury was generally one of the most influential members of the Cabinet and gave excellent support to the Surgeon-General of the Service under his aegis. The allocation was, however, clearly one which could not be defended on logical lines; and in 1939, under the President's emergency power, the Public Health Service was transferred—with the closely related services of the government dealing with education and social security—to the Federal Security Agency where it has continued to operate with success and to benefit by closer connection with allied federal functions.

The new bill (S. 140 and HR 573), in essence, raises the temporary Federal Security Agency to permanent Cabinet status, by providing for a Secretary of Health, Education and Security with under-secretaries, representing each of the three divisions implied in the title of the Cabinet officer.

The three under-secretaries must be qualified experts in their respective fields; and the Children's Bureau is left under the Under-Secretary for Security. The plan includes provision for advisory committees of experts in various fields; and states that the objectives of the department shall be attained so far as possible through state and local agencies, public and voluntary, so as to protect local independence and autonomy. The Committee for the Nation's Health objects to the sharp definition of the three bureaus, to the appointment of under-secretaries who are professional experts, and to the emphasis on decentralization.

Many more conservative physicians are dubious about the bill on almost exactly opposite grounds. The A.M.A. has repeatedly urged a separate Department of Health, with a physician in the Cabinet. The *Journal of the A.M.A.*<sup>1</sup> points out—with apparent disapproval—that the bill does not specify that the new Secretary shall be a physician (or an educator, or an expert in Social Security). This criticism seems wholly unjustified to anyone familiar with the basic principles of our federal government. According to the spirit and practice of American democracy, the Cabinet officers of the national government are political appointees, members of the official family of the President. They represent the party in power. The actual conduct of the department is in the hands of the civil servant who is its permanent head; and the duty of the Cabinet officer is to represent that permanent expert and translate his technical objectives into political reality. This is an altogether sound policy. If the temporary Cabinet officer considered himself an expert, there would be grave danger of interference with the permanent civil service head who should determine technical aims and procedures. The proposed bill actually takes a step in this direction by providing that the Under-Secretary of Health must be a physician. There may be some question as to the wisdom of this provision; but if it is included, it should perhaps be specified that the post should be filled by a physician "qualified in the field of public health."

A second criticism has been made of this bill on the ground that it is

undesirable to combine the three functions of health, welfare, and education under a single Cabinet officer. Many enthusiasts (but not generally including experienced public health experts) have clamored for a Secretary of Health of Cabinet rank. Such a position is, however, somewhat unrealistic. It would obviously require the establishment of three new Cabinet positions to represent the three separate fields involved—a consummation which is highly improbable. It would in practice involve the appointment of a political doctor (or the President's family physician) as Secretary of Health and such an appointee would not be a very influential member of the Cabinet. The combination of the three fields, on the other hand, should provide a post of sufficient importance to attract a really first class leader and one who would carry weight in Cabinet counsels. Finally, the interrelationship between health, education, and security is an increasingly close one and the correlations effected in the Federal Security Agency have been of substantial value. The provision of an Under-Secretary for Health should give ample protection to our own special interests; and the program as a whole seems statesmanlike and sound.

No legislation is perfect and there may be important details in which the present draft should be modified. It would perhaps be desirable to reduce the bill to more general terms and leave details to administrative adjustment. Possibly the bill introduced by Senator Aiken (S. 712) provides the best simplified pattern. In general, however, the objectives of the bill seem admirable and represent the result of much careful consideration by thoughtful students of the problem. It follows a sound middle line between one extreme view which would insist on complete autonomy for health in a separate department under a political "medico"; and another extreme point of view, which would throw health and all other related activities into a large department without even the protection of an Under-Secretary. In any case, suitable amendment—and not rejection—of this measure should be in order. Perhaps the best solution would be the adoption of the Aiken substitute, which accomplishes the same ultimate ends in a simpler fashion.

It is of some interest to note that one of the most distinguished of American surgeons long ago visualized the objectives of this bill. In the book which so many of us are reading with keen pleasure this spring<sup>2</sup> is a letter to President Roosevelt under date of November 10, 1934, in which Harvey Cushing says: "Would it not be a good move just at this time to take into consideration the establishment—if not of a governmental department—at least of a super-bureau of public health to coördinate a number of welfare agencies? Such a department would naturally include such scattered interests as infant welfare and the Children's Bureau, old age insurance, possibly the matter of the veterans' hospitals and health compensation, vital statistics, the administration of the Food and Drugs Act, and the existent public health and Marine hospital service."

Thus, Cushing, more than twelve years ago, outlined the essential objectives of the Fulbright-Taft-Harris bill.

#### REFERENCES

1. *J.A.M.A.* Editorial, 133:398 (Feb. 8), 1947.
2. Fulton, J. F. *Harvey Cushing: A Biography*. Springfield, Ill.: Thomas, 1946.

### ARE OUR HEALTH DEFENSES CRUMBLING?

THE public health program of the United States has made an astounding record during the past fifty years; and that record is primarily due to a gallant

and devoted band of professional public health workers, the troops who have held—and continually advanced—the front line of the war against disease. Our ten schools of public health are organizing more effectively year by year in order to fill the ranks of leadership with even better qualified personnel. Yet disquieting news comes from the front. Boards of health and health officers are clamoring for more workers; but instead of new recruits they face in many instances serious depletion of their present staffs.

The reason for this is simple and obvious. It lies in the fact that while the cost of living and the income of manual workers is going up, the salaries of professional workers have remained static. They are not in this business for money. They are in it because they love their work. They will stand the situation as long as they can. Yet they have their own futures and often that of their families to consider; and in many cases they are ultimately forced to seek some more remunerative vocation than public health.

What such a situation may mean is clearly indicated by what is now happening in the educational field.

"All Buffalo public schools are closed because of the teachers' strike."

"Norwalk schools delayed in opening because of teachers' strike for higher pay."

"Teachers' strike in Jersey town in demand for \$500 pay increase."

"St. Paul schools still closed because of teachers' strike."

"Twelve major school strikes have taken place since September—and many more are being threatened."

"Every state in the Union reports a shortage of qualified teachers."

"One out of every seven teachers is serving on a sub-standard certificate."

"Seventy-thousand teaching positions are unfilled because of the inability of communities to get the necessary teachers."

"Tens of thousands of classes are overcrowded."

These are the headlines of storm damage that are daily coming over the airwaves, in the winter of 1946-1947.

Is this a sudden outburst of temper, disloyalty, acquisitiveness, or other vices from which teachers, and indeed other public servants, are expected by profession and instinct to be free? No, it is a storm that has been breaking for a decade, the warning signals of which were ignored with a reckless disregard of the fateful consequences.

Such a storm has not yet broken in the public health profession—a profession with traditionally the same selfless and idealistic standards of service that have been the tradition of the teaching profession. But here too the storm signals are up. Here too unless the lightning rods are modernized, the leaking roofs reshingled, the sagging levees sandbagged, the coming storm will leave a similar wreckage the consequences of which will be as fateful and as far reaching.

Let us consider the situation in public health nursing. Careful budgetary studies made by voluntary nursing organizations in the New England States have clearly shown that the minimum beginning salary for a public health nurse—in order that she may live decently and meet her professional obligations—must be from \$2,200 to \$2,400, corresponding to the wage of a skilled factory operative. Yet in a survey made in 1945 by the National Organization for Public Health Nursing, it appeared that of 4,000 staff nurses employed by state, county, and city health departments, nearly a third received less than \$1,800 a year, and more than half less than \$2,040. In April, 1946, the salary scale for state health department staff nurses was \$1,500-\$2,160 in North Carolina and \$1,200-\$2,130 in South Carolina.

The situation is by no means limited to nurses. Recent data collected by our Association show that eight states establish a minimum beginning salary of less than \$3,000 for physicians, while similar beginning salaries are less than \$4,000 in twenty-five more states. Yet for physicians trained in public health work, positions under \$6,000 per annum are, at present, not attractive to those who are available and many, even of these now in positions that pay \$6,000 and more, are searching for, and finding better jobs or going into private practice. The physician in public health cannot be blamed for making comparisons between his annual income and the lucrative opportunities in the practice of medicine.

Good sanitary engineers too, are restless under present limitations, and there is no reason why they should not be, when industry and other non-public service offer so much better compensation. And so it goes with workers representing other professions in the health department—the specialists in health education, in nutrition, in the laboratory, dentists, and others.

The degree to which the public health ranks are being depleted is shown by our Association's placement service. This service, incidentally, charges neither employer nor employee. It attempts to help fill the thousands of vacant positions in public health in this country—doctors and dentists, engineers, laboratory workers, health educators, and others upon whose work the public health depends. The number of applicants for these positions is roughly one for each five openings (on January 31 last, 157 candidates for jobs and 738 vacancies). In the case of physicians, the ratio is one applicant for nine positions. On February 14, there were on file in our office, 386 requests for public health physicians, the state and local departments concerned offering a minimum salary averaging \$4,878. These positions called, on the average, for 11 years of training after leaving high school. In our files on the same date were but 48 physicians applying for such posts and asking, on the average, for a minimum salary of \$5,652.

It should be remembered that "economy" does not necessarily mean keeping a dollar in your individual or collective pocket. The word, in its derivative sense means "wise management of the household." It is wise economy and sound management to spend dollars to save lives. The death of a child living on a backstreet, or on the edge of a swamp or in a mountain cabin, the convulsions of an expectant mother, an epidemic of one sort or another, are the kinds of things that happen inevitably when public health service is inadequate or when it is performed by persons not trained for work which unremittingly tests knowledge, experience, and judgment.

The only solution of this problem is to reclassify our public health positions so that they will provide sufficient salaries to attract and hold competent professional workers. Just what these salaries should be in an individual city or state is a matter for local decision. All in all, it would seem probable that most states and cities will need an average of at least 20 per cent increase in salaries if they are to hold their present workers and attract new ones who are competent. In many communities the rate of increase should be much greater.

In the case of state health departments, the time to act is now—before the present sitting legislatures adjourn. Parsimony rather than true economy may cost us heavily in lives during the year, or the biennium to come.

Here are a few of the storm warnings in the public health field:

One-third of the people of the nation are without the services of a local health department organized on a full-time basis.

One out of every five, or more than 1 000 full-time health departments serving the other two-thirds of the population, are without health officers.

Fewer than half the counties of the United States have organized full-time public health protection.

An average of only 61 cents per capita was spent for local health service in 1942 in the face of an estimated need of at least \$1 per capita.

The physicians and engineers who are currently receiving graduate public health training are fewer than the number needed to fill existing vacancies.

The salaries paid to public health nurses are in many—perhaps most—health departments below the decent subsistence level for a self-respecting professional.

The universal opinion of state health officers is that lack of personnel is the chief obstacle to extending health protection in their states.

Unfavorable salary levels represent the outstanding difficulty in securing public health personnel.

Are our public health defenses crumbling?

## Credit Lines

### COLORADO'S ATOM BOMB

The exciting story of what happens when an irresistible force meets an immovable object is told humorously, colloquially, but nevertheless tellingly in the February *Survey Graphic*. The irresistible force in this instance is Florence Sabin, M.D., the immovable object the Colorado state public health situation.

In an article entitled "Dr. Sabin's Second Career," Albert Q. Maisel tells how the "little old lady," as they call her in Colorado, came home to retire, was made chairman of the Subcommittee on Health of the state's Postwar Planning Committee on the theory that her age would keep her close to her fireside and her knitting.

Before anyone was aware of it she was needling every politician, dairyman, and industrialist about Colorado's backward health program, its high diphtheria, scarlet fever, and infant mortality rates, lack of modern sewage disposal and many other unfavorable conditions.

And how did she do this? Well, first she got a state survey by Carl Buck, Dr.P.H., Field Director of the American Public Health Association. Then she told the story of its findings everywhere, and she outlasted everyone else in riding through snowdrifts to speak in little towns; she got the help of all sorts of people who were surprised to find they had pledged themselves to her program; she got people to introduce health bills to which they started out by being hostile. The Democratic Governor says the Republican legislature will pass the program of her Subcommittee because "there isn't a man in the legislature who wants to tangle

with her." And all the time she is reported to be so gentle "you think you're dealing with Whistler's Mother," as one man put it. She is said to have "an amazing ability to open hostile minds, to win people over."

The moral of the tale: Get an atom bomb if your state health department structure and performance need overhauling.

### RELIGION IN ACTION

An interesting illustration of the concern of religion with current life is the Statement on Legislative Policy by the Friends Committee on National Legislation for 1947. Among other purposes for which legislation is recommended are: generous support for the Public Health Service for adequate medical research, care of the mentally ill, extended health service in schools and for the campaign to eliminate venereal disease; and for ratification of the proposed World Health Organization Constitution and appropriation of the United States' share of its budget. Available from Friends Committee on National Legislation, 2111 Florida Ave., N.W., Washington 8.

### AIDS TO HEALTH EDUCATION IN WASHINGTON STATE

The Washington State Department of Health (1412 Smith Tower, Seattle 4) has prepared a *Bibliography of Pamphlets* for distribution to local health agencies. In addition to a page of suggestions as to when and how to use what pamphlets, there is a listing of the pamphlets by subject. All of the material listed is available without charge in reasonable quantities from the state or local health departments. For those



who want quantity distribution, however, they are also listed by original distributor with indication as to cost. Frequent supplements to the bibliography are planned.

#### ECONOMIC SECURITY FOR NURSES

The nursing profession has been in the lead among the several public health groups in bringing unfavorable salary conditions to public attention. At its biennial meeting in 1946 the American Nurses' Association adopted the Economic Security Program by which the state and local associations are urged to become the exclusive agents of their respective members in the fields of economic security and collective bargaining.

Now the Nursing Information Bureau of the American Nurses' Association (with the National League for Nursing Education and National Organization for Public Health Nursing) has prepared a fact sheet of 21 questions and answers about the program. It is designed for editors and others who may be writing about these problems, is written in clear and simple language, and should contribute much to general understanding that salaries and other conditions of work are related to quality of nursing service.

Available from Nursing Information Bureau, 1790 Broadway, New York 19.

#### THE RED CROSS DURING SEVEN WAR YEARS

The American Red Cross recently published a report of its service record for the seven years ending June 30, 1946, a period encompassing all of World War II and part of the uneasy peace following. Although done in black and white, its eye appeal is outstanding for the type (multilith process) is clear-cut, the paper is good, and the pictorial charts imaginatively drawn.

Perhaps the most striking feature of this report is the number of volunteers

and the total hours served—a record of citizen concern that might well serve for peacetime as well. Says Basil O'Connor in the foreword, "Here in sharp focus is a picture of our continuing campaign to alleviate the suffering caused by war and disaster and to broaden the scope of community work in safety, health, and general welfare. For the Red Cross the war against human suffering never ends."

Available from American National Red Cross, Washington, D. C.

#### THE RAT CONTROLLER

The Health Division of the St. Louis city government is out to rid the city of rats. Following the recent passage of a city ordinance it established a Rat Control Section in the Health Division. Its Director is John Sadowski, a chemical engineer with experience in the St. Louis Water Department, the Milk Control Section of the Health Division, and the Housing and Neighborhood Study.

As part of the rat control program the new section is publishing a monthly news sheet, entitled "The Rat Controller." Vol. 1, No. 1, appeared in February, 1947. This tells of the rat control activities carried on by the Unit. It also tells what part the average citizen has in this campaign. The news sheet is good health education material for which its Editor, Robert M. North, Education Service Supervisor, is to be congratulated. Copies available from Room 62, Municipal Courts Building, St. Louis, Mo.

#### TUBERCULOSIS INDEX

The first volume of what is reported to be the "only publication of its kind in the world" was recently received from England at the moment when her coal crisis was at its most critical stage. It is the quarterly *Tuberculosis Index and Abstracts of Current Literature*. Its object is "to provide a complete list

of current articles on all aspects of tuberculosis as they appear in world scientific, medical, and sociological literature." The first issue, September, 1946, includes material published in April, May, and June. Our congratulations to the Editorial Board of the *Index* for initiating this work. The quarterly is available from Tavistock House, Tavistock Square, London, W.C. I, England, at \$5 per year.

#### CONNECTICUT MOVES TOWARD HEALTH UNITS

For 30 years Connecticut has had a law permitting groups of towns (you remember that the town has been the important unit of local government in New England since Colonial days) to form sanitary health districts. For a full dozen years it has had a bill under consideration authorizing cities, towns, and boroughs to unite to form health districts large enough to sustain a full-time district department of health. In the successive legislative sessions of 1941, 1943, and 1945, bills that would have provided state aid to such consolidated health districts were defeated. At the beginning of 1947 only half of the state's population—in 13 cities—had the services of a full-time health officer and no rural area had such service.

But the February 17 *Weekly Bulletin* of the State Department of Health indicates that a new day may be ahead. Again the State Health Department has sponsored a bill for state aid to consolidated health districts, known as the Health District Bill—this time, however, with a difference. Now it can point to resolutions of the Connecticut Health Officers' Association, the Connecticut State Medical Society, the Connecticut Tuberculosis Association, the Connecticut Parent-Teacher Association, the Connecticut Public Health Nursing Organization, and the Connecticut League of Women Voters in favor of

full-time health service throughout the state and of the proposed Health District Bill. If the Connecticut legislators haven't already noticed that the three last mentioned of the above organizations are made up of women, they'd better remember now the old line that "Hell hath no fury like a woman scorned."

#### "POST GRADUATE MEDICINE" MAKES ITS BOW

In January, 1947, *Post Graduate Medicine* was launched as the official monthly journal of the Postgraduate Medical Association of North America. It will contain the papers and diagnostic clinics presented at the annual meeting of the Postgraduate Association which have hitherto been published in a single annual volume. The *Journal* has an informal editorial approach, keeping in mind the reader, the average general practitioner, first as human being, second as scientist. Legible typography and illustrative material point up the text. Business Manager, Paul K. Whipple, 515 Essex Building, Minneapolis. Price \$8.00 per year.

#### RICHLAND COUNTY'S ANNUAL REPORT

There are a number of notable things about the Mansfield City and Richland County (Ohio) Health Department *Annual Report* for 1946. Emphasizing the shortage of medical health officers is the fact that this county of more than 70,000, although with an organized full-time health department for a number of years, had three health commissioners during the year, two of them serving part-time and no one of them serving as much as six months. The report is signed by a fourth commissioner, Fred O. Tonney, M.D., who took office at the beginning of 1947.

The second notable item is the Commissioner's frank statement that the 50 cents per capita spent by the city

and county (68 cents including federal funds) for health services is only half of what is required "to provide a minimum of acceptable health protection for any community." Among the deficiencies that are pointed out are lack of public health nursing service to expectant mothers, insufficient school health services, lack of dental service to indigent children in rural areas, lack of coordinated effort toward cancer control, and inadequate food and milk inspection.

If the citizens will read and heed the first two pages of Dr. Tonney's report there is no reason why they should not have the complete modern health department for Richland and Mansfield County that he says is possible with the pooling of urban and rural financial resources.

#### AIDS FOR CITIZEN DISCUSSION

The National Planning Association has recently put out a new type of publication on an experimental basis. It is called "Dare Farmers Risk Abundance?" which is a combined report of the Agricultural Committee and a *Program Discussion Guide* for a group discussion of farm price and production problems. The *Program Guide* is a folder that fits as a cover of the pamphlet. It has a picture of the classroom and says, "This is your seat. Turn over the page and let's get started." The technique might easily be applied to a discussion, say of community health problems. Pamphlet and guide available from National Planning Association, 800 21st St., N.W., Washington 6, D. C. 25 cents.

#### MULTIPLE SCLEROSIS EDUCATION

The Association for the Advancement of Research on Multiple Sclerosis (see November *Journal*, p. 1357) has recently published *Educational Pamphlet No. 1*, a brief discussion of the prevalence of the disease, its significance

as a social problem, its cause, and treatment. It is written for the lay reader as a part of the association's campaign to get support for work in behalf of the sufferers from this disease. Available from the Association for Advancement of Research on Multiple Sclerosis, Inc., Fifth Avenue and 103rd Street, New York 29, N. Y.

#### KANSAS TELLS ITS PUBLIC

The *Monthly News Letter* of the Kansas State Board of Health starts the year 1947 with a new department, "What We Do!" Here it is planned to publish a series of articles on the work of the various divisions of the State Board of Health in order to keep the allied professions, other state and local officials, and the general public informed of the objectives and activities of public health agencies. The first article by Leon R. Kramer, D.D.S., outlines the work of the dental division which has three phases: research, education, and care.

#### FOR MATERNITY CLINICS

The February *Briefs* of the Maternity Center Association (654 Madison Avenue, New York 21) publishes a talk by the English obstetrician, Grantly Dick Read, M.D., outlining his philosophic approach to pain in childbirth, together with comments of two other obstetricians, George W. Kosmak, M.D., and Blackwell Sawyer, M.D. "The interest in this system of education and relaxation beginning in early pregnancy has been so great," say the editors of *Briefs* that they "consider it a mandate to print a digest of his remarks for all to study."

#### "RHEUMATIC FEVER: CHILDHOOD'S GREATEST ENEMY"

National Heart Week, February 9, was observed by the Public Affairs Committee with the publication of its pamphlet No. 126, *Rheumatic Fever:*

*Childhood's Greatest Enemy.* Comprehensive and readable, its 32 illustrated pages give the essential facts about rheumatic fever and indicate the co-ordinated community action needed. It also describes the London County Council's Rheumatism Scheme through which one hospital bed for every 550 school children is provided. The New York City ratio is only a fourth or fifth as high.

Available from Public Affairs Committee, 22 East 38th Street, New York 16. 10 cents.

PUBLIC AFFAIRS DEPARTMENT IN  
LADIES HOME JOURNAL

In the March issue the *Ladies Home Journal* (Curtis Publishing Co., Philadelphia 5), started a Public Affairs Department under the editorship of Margaret Hickey. In this first issue "It's Time to Volunteer Again" illustrates how, even with war needs no longer present, the volunteer task is still a continuing one and "The Volunteer Worker, 1947 Style" tells the story of Denver's post-war organization of volunteers.

This new department will maintain a consultation service as well as print articles on treatment of common community ills. Miss Hickey is on the St. Louis Social Planning Council and the Veterans' Demobilization and Reemployment Committee. During the war she was chairman of the Women's Advisory Committee of the War Manpower Commission. From 1944 to 1946, she was president of the National Federation of Business and Professional Women's Clubs.

CAN SCIENTIFIC EXHIBITS BE  
EVALUATED?

The A.P.H.A. Committee on Scientific Exhibits takes its job rather seriously. Some of you may have wondered what on earth the committee members were doing at the Cleveland meeting wander-

ing around the exhibits and checking off items on a complicated questionnaire.

Now we know the answer. They were asking themselves, "Why have a scientific exhibit? What message is each scientific exhibitor trying to put across? How successful is he? In what way do the exhibits contribute to the annual meeting?"

There seems to be no foolproof measuring rod to tell us what the innocent onlooker gets out of an exhibit. At the time of the New York World's Fair an effort was made to determine the teaching value of health exhibits. Yet, even if Mr. Citizen learns a new fact, does he behave differently the next day? Much research remains to be done in this field.

Without pretending to assess the educational values, the committee did rate the various exhibits subjectively as to which seemed to state its message most clearly, and made effective use of such exhibit techniques as proper kind of lettering, attractive color, inconspicuous but effective lighting, and art work. On this basis the committee members felt that the following were the four best exhibits in Cleveland:

Division of Cancer Control—New York State  
Department of Health  
National Foundation for Infantile Paralysis  
Preventive Medicine Division, U. S. Army  
U. S. Public Health Service

The New York State exhibit with the talking mirror rated high because of its original method of getting audience participation, giving a personal answer to specific questions. The National Foundation for Infantile Paralysis exhibit provided for some audience participation and had excellent three-dimensional sections which reported on progress in seven different aspects of the poliomyelitis problem. The U. S. Army presentation capitalized on everyone's interest in how military authorities had handled global health problems and made good use of several tech-

niques. The U. S. Public Health Service display attracted attention to its unusual arrangement, using large, light frames to display excellent photographs and drawings illustrating ten special fields of activity.

One is inclined to question the effectiveness of an exhibit with seven or ten sections, but the committee was forced to admit that at least the audience is made aware of the broad interests of the agency concerned.

Material presented in the scientific exhibit may reach an even wider audience than listens to a formal paper. Often a weary Association member is torn between attendance at several section meetings. When a timely subject is presented in exhibit form, however, it is possible to take it in at one's leisure and to talk over mutual interests with the booth attendants. It augurs well for the Atlantic City meeting that there will be even more space for Scientific Exhibits. The committee has been encouraged to believe members of the Health Education Section will participate in rating the exhibits. If this is done, the exhibitors will have the benefit of a larger body of professional opinion.

#### ALONG THE WAY TO SCHOOL HEALTH

*School Administrator, Physician, and Nurse in the School Health Program—Functions and Education* is a report recently published by the Metropolitan

Life Insurance Co. It is sponsored by the National Conference for Coöperation in Health Education, which has 45 member agencies, among them the American Public Health Association.

The report grew out of a series of three discussion conferences dealing respectively with the nurse, the physician, and the administrator. Each conference divided itself into four smaller groups on home and community relationships, school health services, control of environment, and health education, respectively. The final report was then fashioned out of these 12 separate reports by a coördinating committee whose chairman was Clair E. Turner, D.Sc.

The report has two values: its addition to the sum of knowledge as to what school health service should encompass and what training its practitioners should be armed with; it also is valuable in illustrating a technique for discussion and planning, a technique that utilizes the democratic play of mind upon mind. In this connection the procedure of the conferences is fully outlined.

It is expected that future conferences will be held relating to the functions and education of other professions in the school health program—public health administrators, teachers, dentists, nutritionists, and others.

Available from the Metropolitan Life Insurance Co., New York, San Francisco, or Ottawa.

## BOOKS AND REPORTS

*All reviews are prepared on invitation. Unsolicited reviews cannot be accepted. All books reviewed in these columns may be purchased through the Book Service.*

**Hygiene**—By F. L. Meredith, B.Sc., M.D. (4th ed.) Philadelphia: Blakiston, 1946. 838 pp. Price, \$4.00.

The philosophy underlying the approach to the problems of health in *Hygiene* finds expression in the modern idea that man is a unit and that the purpose of life is to function, to live fully in carrying out some worthy purpose in life. *Hygiene* is of value only as its teachings are translated into living, and the theme running through this edition is "what health situations exist in the life of individuals and peoples, what health objectives arise from them, and what action is scientifically appropriate on the part of the layman, especially the college student?"

This 4th edition is an extensive book covering wide fields of health and including not only personal hygiene but important aspects of public health. The revision has been complete with inclusion of new findings in medical science and a rearrangement of material. The general organization of subject matter is excellent, although some teachers might prefer a greater unification of the material dealing with the various aspects of personal hygiene. Everyone, either consciously or unconsciously, strives to attain certain recognized health objectives. The author has placed considerable emphasis on the hygiene of everyday life. The methods by which one may find an answer to his personal problems are suggested and discussed.

"Forces for Health," one of the introductory units, makes a special contribution to the book. In it are discussed the agencies developed by man in

his war against disease and ill health. Included also is a chapter on the beginning of medicine which is of much interest and cultural value. This same interest in the historical aspect of the subject finds frequent expression throughout the book. Reproduction and mental health are discussed at length. Because of the current interest in these subjects, the college student will find their discussion not only interesting but very helpful.

*Hygiene* is excellent in its approach to the problems of health. It contains extensive and valuable material interestingly presented for both teachers and students.

W. R. MORRISON

**Psychoanalytic Therapy** — By Franz Alexander, M.D., and Thomas Morton French, M.D. New York: Ronald Press Co., 1946. 353 pp. Price, \$5.00.

This book is an important contribution to methods of psychotherapy, their evaluation, and their relation to traditional psychoanalytic procedures which are also subjected to critical study. It is written with a minimum of technical terms and would be useful to any doctor interested in keeping abreast with trends in psychiatry. It illustrates clearly a wide variety of cases treated by different doctors, and the many different practical ways in which the dynamic principles of psychoanalysis can be employed for short therapy. It also recognizes the need for long-term treatment in other cases, although emphasizing the fact that there are disadvantages to any routine procedure.

The methods described are not novel,

but their systematic use in carefully planned therapy, in which the doctor consciously uses his observations of the patient and his knowledge of psychopathology and dynamics, is very different from the more or less haphazard "intuitive" therapy often practised. The goals and methods of treatment in terms of the treatability of the patient are discussed for various types of problems. There is no effort to reconstruct the past history of the patient in its entirety, but attention is "focused upon the patient's problem in adjusting to the present external reality." The patient is helped to find a new solution for his old unsettled conflicts, whether through relationship to the doctor or in his everyday life. A large number of the cases are neurotic breakdowns on formerly well adjusted individuals, although other types are illustrated.

The importance of this study to public health lies in the prevention of chronic or more serious developments in many patients.

FLORENCE POWDERMAKER

**The Health of the School Child—**  
*By Gertrude E. Cromwell, R.N. Philadelphia: Saunders, 1946. 256 pp. 46 illus. Price, \$2.50.*

This book on school nursing is based on progressive and sound principles. The discussion centers around the needs of the child while he is in school and various ways school personnel, particularly the school nurse, can foster his optimal growth and development. For the most part the author has a well rounded point of view and presents the results of the more important of modern studies in the field. The great need for more scientific and definitive studies is clear, but the author of this volume cannot be held responsible for the fact that there is often little but opinion to guide her. That she has chosen so wisely is the reader's good fortune.

This reader, however, wondered why

so much emphasis was given to the Snellen test for visual acuity and the Massachusetts Vision or other screening tests were not discussed. Similarly there was no mention of the pitch tone audiometer, or newer methods of treatment of scabies and pediculosis. The problem of tuberculosis in school personnel was not discussed. Nor was the American Public Health Association's useful volume on the control of communicable diseases included in the bibliography. But such minor omissions should not retard the wide use of this excellent little book by school nurses, doctors, health officers, health educators, school officials, and others interested in the health of school children. It is probable that the book will prove most valuable to interested lay persons.

LEONA BAUMGARTNER

**Nutrition in Public Health—**  
*By Lucy H. Gillett. Philadelphia: Saunders, 1946. 303 pp. Price, \$2.75.*

The author of this book displays a comprehensive understanding of family nutrition problems as they are affected by habit, education, economic status, available food, and racial customs. In dealing with these problems, the food for the various members of the family is evaluated. If changes need to be made there are suggestions for the food needed or a substitute. The author always remembers that she is dealing with human beings when changes are needed in food habits.

A daily food guide that is similar to the "basic seven" pattern is used. The nutritive value of various foods is presented in simple but effective tables or charts. Well chosen photographs and illustrations also enhance the text.

In addition to the public health nurse, the book will be useful for any person teaching nutrition to families. Many laymen would also find it a helpful guide for better nutrition.

LOLA T. DUDGEON

**Your Health and Safety**—By *Jessie Williams Clemensen and William Ralph La Porte*. New York: Harcourt Brace, 1946. 592 pp. Price, \$2.12.

Attractively printed and illustrated, this high school text now is revised along two major lines—(1) all material, including the 75 pages on safety, has been brought up to date and somewhat expanded; and (2) the style of approach is dramatically improved.

Personalized, as the title infers, the text appeals to youth to seek scientific advice and "avoid the consequences of uninformed conduct."

Scientific material covering the fields of physiology, nutrition, disease prevention, public health protection and safety is jet propelled, as it were, to give strong motivation to action in control over body and mind and the development of a normal personality. The student is forewarned that at every period in life health is attained only by intelligent application of scientific findings and alertness to avoid accidents and sickness.

Devices to attract interest include activity charts, habit check lists, charts to help analyze physical, mental, emotional, and social health.

Featured are an excellent index, a 13 page glossary, and an 8 page appendix of source material.

ETHEL M. HENDRICKSEN

**Infant and Child in the Culture of Today**—By *Arnold Gesell, M.D., and Frances L. Ilg, M.D.* New York: Harper, 1946. 399 pp. Price, \$4.00.

This excellent book presents the overall mental development of the child from birth to school age soundly and conservatively. It deals with the difficulties of the child in his attempts to mature in today's complex culture. Norms of development for different ages are interpreted in terse, useful form. There is a useful chapter on the nursery school and also a long section

on the guidance of growth which includes problems such as bowel and bladder control, and sex education, discussed with practical reference to the child's developed capabilities. The Appendix contains a description of the Yale Guidance Nursery and an expert list of books and music suitable for children.

The book will prove valuable to the pediatrician as well as the intelligent layman. The authors' style is elaborate, occasionally resulting in difficult reading, but the meaning is everywhere clear and its many editions testify to the book's lay popularity.

STUART S. STEVENSON

**Sex, Marriage and Family**—By *Thurman B. Rice, M.D.* Philadelphia: Lippincott, 1946. 272 pp. Price, \$2.50.

A decent book full of common sense, a natural and sound philosophy, and a gentle tolerance of the manifestations of human biology in the contemporary social setting.

The fifteen chapters deal with three major topics with which the author, for many years a health educator and administrator, has dealt in person professionally and by the printed and spoken word from official platforms with successful influence.

The first six chapters treat of the beginnings and meaning of mating and marriage. The next five with the coming of the baby, something of the economics and social philosophy of marriage, and some of the factors determining the choice of husband and wife. The last four chapters deal with war and post-war problems of the young people who are the present hope of a confused world and are themselves the victims of an unoriented and rather crude emotional outlook upon marriage and the rearing of children.

Among the many attempts to pass on a clean and tender pattern of life from the leaving to the coming generation,



this book by a gentle and hopeful physician stands out, above most of its competitors in a crowded field, for its sanity, its temperance and balance of spirit.

Many of the young and their elders will read it with simple pleasure. The three page index is adequate for its purpose.

The book can be recommended to the lay public for self-education.

HAVEN EMERSON

#### DDT and the Insect Problem—

By James C. Leary, William I. Fishbein, and Lawrence C. Salter. New York: McGraw-Hill, 1946. 176 pp. Price, \$2.50.

The advent of DDT produced widespread advances and major modifications in the field of insect control, and this book serves as a welcome supplement to modernize volumes previously written on insect control. Framed in the language of the layman, but well grounded in scientific accuracy, it presents clearly and concisely the fundamental facts and observations for the use of DDT and contains a rather extensive bibliography of the more important research in the field. Consideration is given to the utility of DDT for combating insect disease-vectors, household and agricultural pests, with additional brief discussions on the chemistry and history of DDT, and the rôle that it played as a weapon against disease in World War II.

M. D. HOLLIS

**School Boards in Action—***Twenty-fourth Yearbook of the American Association of School Administrators.* Washington, D. C.: National Education Association, 1946. 412 pp. Price, \$2.00.

This is a handbook for school board members and sets forth guiding principles, with concrete examples, which will help school board members to solve complex local problems. Data fur-

nished by more than 3,000 city and county school superintendents, board members, and other educational officials were utilized by the commission which prepared this report.

At first glance the book might be considered outside the interests of public health. This reviewer, however, believes that it warrants the thoughtful attention of those health workers who are striving to improve community health standards. "Good planning procedures on the part of a board of education require coöperative effort between the board and other community agencies, such as those concerned with planning improvements in community health, recreation, welfare, and community development." This statement is quoted from "Signposts for Service," summarizing the chapter on "Planning Better Schools for the Future."

Men and women to the number of nearly 400,000 make up the school boards of this country. These boards are legally empowered "to erect buildings, to hire teachers, to select courses of study and textbooks, to decide upon length of school terms, and to fix amounts to be raised by taxes for schools." Health considerations are implicit in all of these responsibilities.

Professional standards in education as in public health are rising, and it is heartening to have this evidence of the high standards expected of school board members. The plan of summarizing each chapter in a series of short paragraphs entitled "Signposts of Service," enables the reader to survey quickly the contents of the book.

LOUISE STRACHAN

**Directory of Biological Laboratories. With Buyers' Guide—***Chicago: Burns Compiling and Research Organization, 1946.* 120 pp. Price, \$3.00.

The first section of this directory lists by states the commercial biological

laboratories of the United States. Clinical and public health laboratories are omitted, although certain laboratories operated by the federal government are included. The functions and characteristics of each laboratory are listed, together with the name of the individual acting as purchasing agent.

The second section lists manufacturers and distributors of laboratory apparatus, materials, supplies, instruments, equipment, etc. These are arranged alphabetically by products and include complete mail addresses. This section should be of value to the laboratory director seeking new sources of supply or an unusual item.

E. K. KLINE

*Victory Over Pain—By Victor Robinson, M.D. New York: Henry Schuman, 1946. 338 pp. Price, \$3.50.*

The theme of this delightfully written history of anesthesia is well summarized by the last paragraph of the author's introduction: "This book, written on the eve of the centennial of merciful surgery, relates the long struggle of science against suffering, unsuccessful for ages and seemingly no nearer the goal—until the unexpected achievement. The revelation of anesthesia is a chapter in the life of science where it merges with the history of humanity: as such it should be part of the general education of the present generation."

Presentation of this fascinating subject is unique, consisting of biographical sketches of men who contributed to our knowledge of anesthesia and connecting chapters that furnish continuity. The sketches are real drama in which the pioneers of anesthetics seem to live once more surrounded by all of the uncertainties, blunders, and human jealousies of their time; yet each sketch is well documented for historical accuracy. Such men as Long, Jackson, Morton, Simpson, and Koller are portrayed as

actors on the stage of scientific progress in the conquest of pain. The author demonstrates the fine art of presenting history that is highly entertaining yet acceptable in fact. The factual value of the book is enhanced by a selected and annotated bibliography and by an author-subject index.

CHARLES E. SHEPARD

*Community Centers as Living War Memorials—Compiled by James Dahir. New York: Russell Sage Foundation, 1946. 63 pp. Price, \$.50.*

Since many community groups in this country are today confronted with the problem of planning suitable memorials, Mr. Dahir has performed a most valuable service by compiling a bibliography of interesting, informative, and current literature on the various aspects of group activities in general and community centers in particular. He has traced the purpose and the growth of such projects through the years and has described the various types that exist in this country.

Emphasis is placed on the expressed desire of service men for purposeful war memorials in place of the usual statues that were erected immediately after World War I.

Mr. Dahir has selected definitive material which vividly portrays the numerous activities of community centers and which depicts the great need that exists for similar programs on a nation-wide scale. This book is of particular value to those groups and agencies at present concerned with planning war memorials.

CHARLES F. WILINSKY

*The Money Value of a Man—By Louis I. Dublin and Alfred J. Lotka. (rev. ed.) New York: Ronald Press, 1946. 214 pp. Price, \$6.00.*

This important book was published by Drs. Dublin and Lotka in 1930. It has been adequately revised in the 1946 edition, and has been brought

forward to meet the changing conditions and the modifications in our economic and social concepts.

To the revised edition have been added chapters on The American Family, Income in Relation to Age and Economic Status, Social Insurance in Relation to the Money Value of a Man, and an Appendix B, entitled "Age Schedules of Family Consumption Units and Savings."

The money values are calculated on the basis of the purchasing power of the dollar in 1946, and in accordance with recent social concepts of increased community responsibility.

This book has had, and should continue to have, a profound influence on public health. The authors present the unique point of view that each individual in the community is a community asset. These assets may be safeguarded, protected, and conserved, as are other financial assets of the community, or they may be destroyed, wasted, discarded, or carelessly thrown away. The authors have demonstrated, in dollars and cents, just what a man is worth to his family and to his community. They have demonstrated also that disease of an individual causes a financial loss to the community—a loss which can be measured and computed. They also have demonstrated that preventive medicine and public health yield financial benefits to the community, and have shown that these benefits can be determined in a perfectly simple but concrete way.

This book is recommended to every public health administrator as an essential book of reference.

W. G. SMILLIE

Daniel Coit Gilman: Creator of the American Type of University—By Abraham Flexner. New York: Harcourt, Brace, 1946. 164 pp. Price, \$2.00.

If one man were to be selected as responsible for the modern concept of

graduate university training in the United States, that man undoubtedly would be Daniel Coit Gilman, the first president of The Johns Hopkins University. The passage of some three-quarters of a century since his inauguration to that office has disclosed more firmly than ever the essential validity of the revolutionary changes in higher learning which he instituted and accomplished almost singlehanded in a new university in only twenty-five years.

Dr. Flexner, himself a product of that university, and responsible in no small measure for the general development of graduate education in this country, does a major service to the present generation in summarizing within small compass the seminal ideas and ideals of Gilman. The volume is a history of ideas rather than a formal biography of a man. Other lives of Gilman supply the missing or understressed features of his history.

Every student of the educational process will profit in re-learning the essential elements of graduate training in medicine, in the physical sciences, in the humanities, and in the classics, as they were impressed upon this country by the vision and the persistence of one man! The story is simply, briefly, and cogently told. The author's theme does not once escape us, as epitomized in Gilman's own words: "The real efficiency of a college is admitted to consist, not in buildings, nor in sites, nor in apparatus, but in the number and character of the teachers employed."

ABEL WOLMAN

Notes on Nursing: What It Is and What It Is Not—By Florence Nightingale. London: Harrison, 59, Pall Mall, 1859. Reprinted by J. B. Lippincott Company, Philadelphia, 1946; and by D. Appleton-Century Company, New York, 1946. 79 pp. Price, \$1.25.

That two of our large publishing

firms should issue a reprint of Florence Nightingale's *Notes on Nursing* in the same year, one from the first edition printed in London in 1859, and one from the first edition published in 1860 in New York, permits, we presume, three deductions: that the other printings of the first edition have been exhausted, that students are still reading, by assignment or by choice, these "momentous minutiae," and that there is something so timeless, so practical and precious to nurses that they are eager to possess their own copies of the original *Notes*.

A rereading never fails to leave one

amazed at Miss Nightingale's understanding of the sick, of the family, and of nurses.

The *Notes* really need no foreword even today, but these reprints are doubly valuable because of the addition, in the case of the Lippincott edition, of a foreword by Annie W. Goodrich, in the case of the D. Appleton-Century Company reprint, by Virginia M. Dunbar.

It is pleasant to know that every nurse may now own a facsimile of the original *Notes* and realize anew her debt to the indomitable Florence.

DOROTHY DEMING

## BOOKS RECEIVED

*Listing in this column acknowledges the receipt of books and our appreciation to the senders. Space and the interests of readers will permit review of some, but not all, of the books listed.*

- BIOCHEMISTRY OF CANCER. By Jesse P. Greenstein. New York: Academic Press, 1947. 389 pp. Price, \$7.80.
- CHEMOTHERAPEUTIC AND OTHER STUDIES OF TYPHUS. By M. Van Den Ende, *et al.* London: His Majesty's Stationery Office, 1946. 246 pp. Price, \$3.65.
- ENCYCLOPEDIA OF PSYCHOLOGY. Philip Lawrence Harriman, Editor. New York: Philosophical Library, 1946. 897 pp. Price, \$10.00.
- FLAAS OF WESTERN NORTH AMERICA. By C. Andresen Hubbard. Ames, Iowa: Iowa State College Press, 1947. 533 pp. Price, \$6.00.
- HARVEY CUSHING—THE STORY OF A GREAT MEDICAL PIONEER. By John F. Fulton. Springfield, Ill.: Thomas, 1947. 754 pp. 150 illus. Price, \$5.00.
- HEALTH AND FITNESS. By Florence L. Meredith. Boston: Heath, 1947. 325 pp. Price, \$2.20.
- HENRICI'S MOLDS, YEASTS AND ACTINOMYCETES. (2nd ed.) Revised by C. E. Skinner, C. W. Emmons, and H. M. Tsuchiya. New York: Wiley, 1947. 409 pp. Price, \$5.00.
- MEDICINE IN THE CHANGING ORDER. Report of the New York Academy of Medicine Committee on Medicine and the Changing Order. New York: Commonwealth Fund, 1947. 240 pp. Price, \$2.00.
- PENICILLIN IN SYPHILIS. By Joseph Earle Moore. Springfield, Ill.: Thomas, 1947. 319 pp. Price, \$5.00.
- PHYSICAL MEDICINE IN GENERAL PRACTICE. Edited by Arthur L. Watkins. Philadelphia: Lippincott, 1947. 341 pp. Price, \$5.00.
- PRACTICAL PHYSIOLOGICAL CHEMISTRY. By Philip B. Hawk, Bernard L. Oser, and William H. Summerson. (12th ed.) Philadelphia: Blakiston, 1947. 1323 pp. Price, \$10.00.
- RESEARCH AND REGIONAL WELFARE. Edited by Robert E. Coker, with a foreword by Louis R. Wilson. Chapel Hill, N. C.: University of North Carolina, 1946. 229 pp. Price, \$3.00.
- RECENT GROUNDWATER INVESTIGATIONS IN THE NETHERLANDS. Monographs on the Progress of Research in Holland. By W. F. J. M. Krul and F. A. Liefcrinck. New York: Elsevier, 1946. 78 pp. Price, \$1.50.
- SOCIAL WORK YEAR BOOK—1947. Russell H. Kurtz, Editor. New York: Russell Sage Foundation, 1947. 714 pp. Price, \$3.50.
- SURVEY REPORT OF THE SALARY STANDARDIZATION BOARD. New York: State Department of Civil Service, 1947. 301 pp. Price, \$1.50.

## A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

**What WHO Is Doing—You'll** have to be at home with words like WHO, FAO, ILO, PICAQ, and UNESCO before you can read this report intelligently but once you learn to remember who WHO is, you'll get along fine.

ANON. Progress Toward a World Health Organization. Pub. Health Rep. 62, 7:225 (Feb. 14), 1947.

**Case Finding and Follow-Up—**Twelve years of TB testing and x-ray-ing in Syracuse high schools convinces the authorities there of the continuing values in spreading information, finding cases usually early enough for hopeful treatment, and stopping the spread of infection.

AYLING, W. E. Twelve Years of Tuberculosis Case Finding among High School Pupils. J. School Health. 17, 1:13 (Jan.), 1947.

**Virtuosity in Film Reading—**Those of us who have only a bowing acquaintance with tuberculosis control are apt to think of chest x-raying as a mechanically fool-proof procedure. This paper concludes that the interpretation of films is far from an exact technic and much in need of improvement.

BIRKING, C. C., *et al.* Tuberculosis Case Finding. J.A.M.A. 133, 6:359 (Feb. 8), 1947.

**Polio Is a Mild Disease—**Among 22 children exposed to polio, 14 had a febrile illness between 7 and 25 days after exposure; 15 comparable non-contacts who lived on the same block had no fever. The illness is believed to have been subclinical polio. This experience suggests that the disease is a mild, widespread, highly communicable condition which only very infrequently leaves a residual paralysis. About 5

per cent may have a transient paralysis.

CASEY, A. E., *et al.* Relative Frequency of "Subclinical" Poliomyelitis. Am. J. Dis. Child. 72, 6:661 (Dec.), 1946.

**Latest Words on Influenza Vaccine—**Informal discussion by a man well equipped for the job. He says, "My hunch is that (another 1918 pandemic) would be a strain similar in its basic characteristic to the strains with which we are familiar." Results of vaccination against it would depend on several factors, which he considers.

FRANCIS, T., JR. A Consideration of Vaccination against Influenza. Milbank Quart. 25, 1:5 (Jan.), 1947.

**Psychic Tension Aggravates It—**What bitter medicine these sentences will be for some of us! "Overweight has a strong effect on shortening the life span and increasing the development of degenerative diseases. There is little evidence that obesity is a glandular or metabolic disturbance. The psychologic factors in obesity are paramount, since the tendency to overeat is a strong drive for oral gratification." There is a lot more, but I'll spare you.

FREED, S. C. Psychic Factors in the Development and Treatment of Obesity. J.A.M.A. 133, 6:369 (Feb. 8), 1947.

**Community or Individual—**Which?—We are short 50,000 beds for the tuberculous. Who should be chosen first for the available beds? If the question were answered here, it would encourage you to put off reading these papers—which you shouldn't do.

HILLEBR, H. E. Economy of Bed Usage in Tuberculosis. Pub. Health Rep. 62, 6:185 (Feb. 7), 1947.

**When Influenza B Came to Town—**Army students were vaccinated against influenza, navy students weren't.

A month later came the epidemic. Score: Navy, 132; Army, 3.

HIRST, G. K., *et al.* The Effect of Vaccination on the Incidence of Influenza B. *Am. J. Hyg.* 45, 1:96 (Jan.), 1947.

**Here's a New Wrinkle!**—Children migrating into towns with fluorine-rich drinking water are protected against caries in proportion to the length of their stay. In contrast, recent migrants into comparable towns in which the drinking water is free of fluorides have better teeth than those who have drunk the water for longer periods. Just as fluorine-bearing water favors resistance to tooth decay, there may be factors in the fluorine-free water that make teeth more vulnerable to decay.

KLEIN, H. Do Certain Waters Favor Dental Caries? *Science.* 105, 2714:4 (Jan. 3), 1947.

**Now It's Socio-Psycho-Somatic**—Five reasons why the public health nurse should keep out of the mental health field are presented to tempt competent P.H.N.'s to enter it. This is one of those papers you should read twice: once for what it says and once for how it says it.

PLANT, J. E. The Public Health Nurse as a Medium for Mental Health. *Pub. Health Nurs.* 39, 1:3 (Jan.), 1947.

**More Good News**—Penicillin appears to be the best single agent for the treatment of infantile congenital syphilis, say six researchers.

PLATOU, R. V., *et al.* Effect of Penicillin in the Treatment of Infantile Congenital Syphilis. *Am. J. Dis. Child* 72, 6:635 (Dec.), 1946.

**Boarding School Boys With Colds**—Being a once-burnt, twice-shy character, I no longer attempt comments on papers in which I find a  $\pm$ . It says here, however, that each boy tended to have the same number of colds year after year, but the boys differed from one another in the frequency pattern of their colds. And, it says, this find-

ing suggests the need for further investigation of the nature of the constitutional factor in cold susceptibility.

SARGENT, F., *et al.* Further Studies on Stability of Resistance to the Common Cold. *Am. J. Hyg.* 45, 1:29 (Jan.), 1947.

**Tracheal Specimens May Be Misleading**—Bronchopneumonia is what people who are dying of something else often die of. In a large series of post-mortem lung cultures the commonest causes of the terminal pneumonia were found to be pneumococci, influenza bacilli, and beta hemolytic streptococci.

SMILLIE, W. G., and DUERSCHNER, D. R. The Epidemiology of Terminal Bronchopneumonia. *Am. J. Hyg.* 45, 1:1 (Jan.), 1947.

**What Are Your Firsts?**—Two most important health factors are food and housing, insists this British M.O.H. Can ten thousand American health workers be wrong?

SYMONS, A. D. Food and Housing as Health Factors. *M. Officer.* 77, 1:5 (Jan. 4), 1947.

**This Will Open Your Eyes**—The magnitude of the USPHS Research Grants program for the support of medical and related science is stupendous. No government restriction or regimentation is imposed and technical guidance is in the hands of top-notch scientists in each field.

VAN SLYKE, C. J. New Horizons in Medical Research. *Science.* 104, 2711:559 (Dec. 13), 1947.

**Extra! Diphtheria Immunization Protects**—Reported here is the five year diphtheria experience of a British county borough. Among non-immunized children, 517 cases; immunized children, 33 cases. Among non-immunized children, 53 deaths; immunized, none.

WORINDEN, R. C., and WESTBY, G. E. Diphtheria and Diphtheria Immunization in the County Borough of Rotherham *M. Officer.* 77, 2:17 (Jan. 11), 1947.

## A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

**What WHO Is Doing—You'll** have to be at home with words like WHO, FAO, ILO, PICAQ, and UNESCO before you can read this report intelligently but once you learn to remember who WHO is, you'll get along fine.

AXON. Progress Toward a World Health Organization. Pub. Health Rep. 62, 7:225 (Feb. 14), 1947.

**Case Finding and Follow-Up—**Twelve years of TB testing and x-raying in Syracuse high schools convinces the authorities there of the continuing values in spreading information, finding cases usually early enough for hopeful treatment, and stopping the spread of infection.

AYLING, W. E. Twelve Years of Tuberculosis Case Finding among High School Pupils. J. School Health. 17, 1:13 (Jan.), 1947.

**Virtuosity in Film Reading—**Those of us who have only a bowing acquaintance with tuberculosis control are apt to think of chest x-raying as a mechanically fool-proof procedure. This paper concludes that the interpretation of films is far from an exact technic and much in need of improvement.

BIRKILLO, C. C., *et al.* Tuberculosis Case Finding. J.A.M.A. 133, 6:359 (Feb. 8), 1947.

**Polio Is a Mild Disease—**Among 22 children exposed to polio, 14 had a febrile illness between 7 and 25 days after exposure; 15 comparable non-contacts who lived on the same block had no fever. The illness is believed to have been subclinical polio. This experience suggests that the disease is a mild, widespread, highly communicable condition which only very infrequently leaves a residual paralysis. About 5

per cent may have a transient paralysis.

CASEY, A. E., *et al.* Relative Frequency of "Subclinical" Poliomyelitis. Am. J. Dis. Child. 72, 6:661 (Dec.), 1946.

**Latest Words on Influenza Vaccine—**Informal discussion by a man well equipped for the job. He says, "My hunch is that (another 1918 pandemic) would be a strain similar in its basic characteristic to the strains with which we are familiar." Results of vaccination against it would depend on several factors, which he considers.

FRANCIS, T., JR. A Consideration of Vaccination against Influenza. Milbank Quart. 25, 1:5 (Jan.), 1947.

**Psychic Tension Aggravates It—**What bitter medicine these sentences will be for some of us! "Overweight has a strong effect on shortening the life span and increasing the development of degenerative diseases. There is little evidence that obesity is a glandular or metabolic disturbance. The psychologic factors in obesity are paramount, since the tendency to overeat is a strong drive for oral gratification." There is a lot more, but I'll spare you.

FREED, S. C. Psychic Factors in the Development and Treatment of Obesity. J.A.M.A. 133, 6:369 (Feb. 8), 1947.

**Community or Individual—**Which?—We are short 50,000 beds for the tuberculous. Who should be chosen first for the available beds? If the question were answered here, it would encourage you to put off reading these papers—which you shouldn't do.

HILLEBOE, H. E. Economy of Bed Usage in Tuberculosis. Pub. Health Rep. 62, 6:185 (Feb. 7), 1947.

**When Influenza B Came to Town—**Army students were vaccinated against influenza, navy students weren't.

A month later came the epidemic. Score: Navy, 132; Army, 3.

HIRST, G. K., *et al.* The Effect of Vaccination on the Incidence of Influenza B. *Am. J. Hyg.* 45, 1:96 (Jan.), 1947.

**Here's a New Wrinkle!**—Children migrating into towns with fluorine-rich drinking water are protected against caries in proportion to the length of their stay. In contrast, recent migrants into comparable towns in which the drinking water is free of fluorides have better teeth than those who have drunk the water for longer periods. Just as fluorine-bearing water favors resistance to tooth decay, there may be factors in the fluorine-free water that make teeth more vulnerable to decay.

KLEIN, H. Do Certain Waters Favor Dental Caries? *Science.* 105, 2714:4 (Jan. 3), 1947.

**Now It's Socio-Psycho-Somatic**—Five reasons why the public health nurse should keep out of the mental health field are presented to tempt competent P.H.N.'s to enter it. This is one of those papers you should read twice: once for what it says and once for how it says it.

PLANT, J. E. The Public Health Nurse as a Medium for Mental Health. *Pub. Health Nurs.* 39, 1:3 (Jan.), 1947.

**More Good News**—Penicillin appears to be the best single agent for the treatment of infantile congenital syphilis, say six researchers.

PLATOU, R. V., *et al.* Effect of Penicillin in the Treatment of Infantile Congenital Syphilis. *Am. J. Dis. Child.* 72, 6:635 (Dec.), 1946.

**Boarding School Boys With Colds**—Being a once-burnt, twice-shy character, I no longer attempt comments on papers in which I find a  $\pm$ . It says here, however, that each boy tended to have the same number of colds year after year, but the boys differed from one another in the frequency pattern of their colds. And, it says, this find-

ing suggests the need for further investigation of the nature of the constitutional factor in cold susceptibility.

SARGENT, F., *et al.* Further Studies on Stability of Resistance to the Common Cold. *Am. J. Hyg.* 45, 1:29 (Jan.), 1947.

**Tracheal Specimens May Be Misleading**—Bronchopneumonia is what people who are dying of something else often die of. In a large series of post-mortem lung cultures the commonest causes of the terminal pneumonia were found to be pneumococci, influenza bacilli, and beta hemolytic streptococci.

SMILLIE, W. G., and DUERSCHNER, D. R. The Epidemiology of Terminal Bronchopneumonia. *Am. J. Hyg.* 45, 1:1 (Jan.), 1947.

**What Are Your Firsts?**—Two most important health factors are food and housing, insists this British M.O.H. Can ten thousand American health workers be wrong?

SYMONS, A. D. Food and Housing as Health Factors. *M. Officer.* 77, 1:5 (Jan. 4), 1947.

**This Will Open Your Eyes**—The magnitude of the USPHS Research Grants program for the support of medical and related science is stupendous. No government restriction or regimentation is imposed and technical guidance is in the hands of top-notch scientists in each field.

VAN SLYKE, C. J. New Horizons in Medical Research. *Science.* 104, 2711:559 (Dec. 13), 1947.

**Extra! Diphtheria Immunization Protects**—Reported here is the five year diphtheria experience of a British county borough. Among non-immunized children, 517 cases; immunized children, 33 cases. Among non-immunized children, 53 deaths; immunized, none.

WOFINDEN, R. C., and WESTBY, G. E. Diphtheria and Diphtheria Immunization in the County Borough of Rotherham. *M. Officer.* 77, 2:17 (Jan. 11), 1947.



# ASSOCIATION NEWS

SEVENTY-FIFTH ANNUAL MEETING  
AMERICAN PUBLIC HEALTH ASSOCIATION  
ATLANTIC CITY, N. J., OCTOBER 6-10, 1947

## A.P.H.A. TEAM OF SPEAKERS IN WESTERN STATES MAY AND JUNE, 1947

The Association announces that a team of speakers has been organized to attend a series of state and regional public health meetings beginning early in May and extending until the first week in June. This is a pattern similar to that used during 1943, 1944, and 1945, when it was not possible to hold a meeting of the Western Branch, A.P.H.A. This year, however, the Western Branch will definitely hold a meeting in San Francisco, May 27-29, preceded by two days of additional group meetings. The state meetings have been arranged before and after the dates of the Western Branch meeting in order to take advantage of the presence in the West of visitors from other sections and to bring good speakers to those who can attend state meetings but for whom attendance at the Western Branch meeting is not possible. It is expected that a total attendance of several thousand persons will result from the meetings organized by state public health associations and planned by them in the form that will best suit the needs in each state. In so far as team members are desired by the local groups, they will be used for the state programs.

The following schedule of meetings is

in semi-final form and indicates the expectation at the time the *Journal* went to press:

- May 9-10 Missouri Public Health Association, Jefferson City
- May 10-11 North Dakota Public Health Association, Fargo (part of team)
- May 12-13 Minnesota Public Health Conference, Minneapolis
- May 14 Nebraska public health workers, Omaha
- May 16-17 Colorado Public Health Association, Colorado Springs
- May 19-20 New Mexico Public Health Association, Albuquerque
- May 22-23 Arizona Public Health Association, Tucson
- May 27-29 Western Branch, A.P.H.A., San Francisco
- June 2-3 Idaho Public Health Association, Boise
- June 4-5 Utah Public Health Association, Salt Lake City

The team this year will be made up of about ten persons, including Dr. Mary Crosse of Birmingham, England, especially interested in maternal and child health. She is prepared to explain the British system for the care of premature babies, the use of nurse midwives and the administration of nurseries for children. Also included will be Walter J. Pelton, D.D.S., consultant public health dentist on the

staff of the U. S. Public Health Service; two public health nurse team members, each covering part of the circuit, Miss Eleanor Palmquist and Miss Dorothy Rusby, both Assistant Directors, National Organization for Public Health Nursing; Carl E. Buck, Dr.P.H., Field Director, A.P.H.A., will be present at several of the meetings, together with two public health engineers from the A.P.H.A. staff, Francis B. Elder, Engineering Associate and William T. Ingram, Engineering Field Associate. Also Allan Twichell, Technical Secretary, A.P.H.A. Committee on the Hygiene of Housing; Charles B. Frasher, technical consultant in personnel adminis-

tration, A.P.H.A. Merit System Unit; and Reginald M. Atwater, M.D., Executive Secretary, A.P.H.A.

The team members will be prepared again to offer a Roundup Session, in which those in attendance will be encouraged to ask questions which will be debated in public between members of the team, assisted by state representatives, as an illustration of a type of program that has proved provocative in similar meetings.

Persons desiring to attend these meetings should confirm the dates and places with local representatives because of the possibility of a change in final programs.

## APPLICANTS FOR MEMBERSHIP

*The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.*

### *Health Officers Section*

Charles J. Barone, M.D., 24 Gerald Ave., Highland Park 3, Mich., City Health Officer  
 Chester C. Burski, M.D., Rutledge Char. Bldg., Chippewa Falls, Wis., District Health Officer  
 Robert M. Lane, M.D., D.P.H., Box 436, Prince Rupert, B.C., Canada, Director, Prince Rupert Health Unit  
 Arnold Mills, M.D., 73 Hazelton St., Mattapan 26, Mass., Medical Inspector, Boston Health Dept.  
 Colonel Thomas Neilson Page, M.C., Office of the Surgeon, Panama Canal Dept., Quarry Heights, Canal Zone, Asst. Dept. Surgeon, U. S. Army  
 Duurt Klass Rykels, M.D., 1733 W. Caroline St., Baltimore 13, Md., Asst. Director, Netherlands Public Health Service  
 Thomas C. Sims, M.D., Fayette County Health Dept., Fayetteville, W. Va., Health Officer  
 Robert G. Struthers, M.D., D.P.H., 48 St. Andrews Gardens, Toronto, Ont., Canada, Acting Director, Public Health Administration, Ontario Dept. of Health  
 James A. Taylor, M.D., D.P.H., Box 377, Nanaimo, B. C., Canada, Director, Central Vancouver Island Health Unit  
 Salvatore R. Traina, M.D., 527 Bennington St., East, Boston, Mass., District Health Officer

Triantafylos G. Triantafyllou, M.D., 22 Eptanissou, Athens, Greece, Director, Health Center of Athens  
 Norris W. Vaux, M.D., State Dept. of Health, Harrisburg, Pa., State Secy. of Health

### *Laboratory Section*

Martha A. Behan, Antitoxin Laboratory, Otisville, N. Y., Bacteriologist, N. Y. City Dept. of Health  
 Albert L. Belcher, 637 N. 37th St., East St. Louis, Ill., Laboratory Technician, East Side Health District  
 Herbert R. Brown, M.D., 236 Main St., Dansville, N. Y., Director, Livingston County Laboratory  
 Elizabeth C. Chappell, 122 South Stanford, Albuquerque, N. M., Senior Bacteriologist-Serologist, New Mexico State Public Health Laboratory  
 George J. Clark, Ph.G., 1027 Second Ave., Columbus, Ga., Senior Medical Technician in Bacteriology, U. S. Public Health Service  
 Margaret K. Fiscalini, 301 North Santa Rosa Ave., Modesta, Calif., Technician, Clinical Laboratory  
 Josephine A. Foote, 125 W. Washington St., Wausau, Wis., Supervisor, State Cooperative Laboratory  
 Jean W. Glassen, RFD 4, Box 329B, Lansing, Mich., Public Health Laboratory Scientist

- III, Biological Products Division, State Dept. of Health  
 John W. Hawkins, Carbondale, Ill., Bacteriologist I, State Dept. of Public Health  
 Joseph G. Hoffman, Ph.D., 663 North Oak St., Buffalo, N. Y., Director of Cancer Research, Roswell Park Memorial Institute  
 Major L. Roland Kuhn, Sn.C., 6th Army Laboratory, Presidio of Monterey, Calif., Chief, Bacteriology Section  
 Ernest C. McCulloch, Ph.D., D.V.M., State College of Washington, Pullman, Wash., Professor of Bacteriology  
 Gentry Moffitt, M.A., 2107 Dixie Place, Nashville, Tenn., Bacteriologist, State Dept. of Public Health  
 Robert E. Morgan, Florida State Hospital, Chattahoochee, Fla., Chief Medical Technologist  
 Theodore M. Pfeffer, 805 S. 15th St., Newark, N. J., Sterile Ampoule Chemist, Schering Corp  
 Theodore E. Roy, M.D., C.M., Dept. of Pathology, Hospital for Sick Children, Toronto, Ont., Canada, Bacteriologist  
 James G. Shaffer, D.Sc., Vanderbilt University, Nashville, Tenn., Instructor, Dept. of Public Health and Preventive Medicine  
 Orval R. Stokke, Box 1020, Bismarck, N. D., Bacteriologist, State Board of Health  
 Robert B. Stratton, 516 Greer Bldg., New Castle, Pa., Laboratory Director, Stratton-Page Laboratory  
 Charlotte C. VanWinkle, M.D., D.P.H., 620 S. 3rd St., Louisville 2, Ky., Director, Kahn Laboratory, State Board of Health  
 Franklin H. White, 1008 Main, Alton, Ill., Bacteriologist, State Dept. of Public Health

#### *Vital Statistics Section*

- James S. Fuller, 631 Jay St., Sacramento, Calif., Statistician, State Dept. of Public Health  
 Ricardo Granillo R., M.D., Sindicalismo 54, Mexico, D. F., Mex., Jefe del Departamento de Estadística, Secretaria de Salubridad y Asistencia  
 Anna P. Halkovich, M.B.A., National Office of Vital Statistics, Washington 25, D. C., Statistician  
 Irene M. Markowitz, 1031 Ansel Rd., Cleveland, Ohio, Tuberculosis Statistician, Cuyahoga County Tuberculosis Clinic  
 Elwood C. Murselman, M.S., State Division of Health, Jefferson City, Mo., Director of Vital Statistics  
 Earl R. Thran, 415 E. William St., Ann Arbor, Mich., Student, School of Public Health, University of Michigan

Margaret Zwolak, 1442 Somerset Place, N.W., Apt. 101, Washington 11, D. C., Asst. Research Worker, District of Columbia Tuberculosis Assn.

#### *Engineering Section*

- John S. Alden, M.S., 512 Burkhardt Ave., Dayton, Ohio, Supervisor, Bureau of Food Inspection and Sanitation, City Division of Health  
 Seymour Barfield, 2308 Linden Ave., Long Beach 6, Calif., Junior Sanitation Inspector, Los Angeles City Health Dept.  
 Caleb B. Bell, Washington Park 200, Washington, N. C., Sanitarian, Beaufort-Hyde District Health Dept.  
 Joseph E. Borches, 603 State Planters Bank Bldg., Richmond, Va., Insect and Rodent Control Specialist, U. S. Public Health Service  
 James M. Doughty, Jr., 236 Delgado, Santa Fe, N. M., Supervisor of Milk Sanitation, State Health Dept.  
 Cecil C. Fletcher, 4308 Old Brook Rd., Richmond, Va., Sanitarian, U. S. Public Health Service  
 Joseph J. Gilbert, 2045 W. Hunting Park Ave., Philadelphia 40, Pa., Engineer, Sanitary Engineering Division, Link-Belt Co.  
 C. W. Groppe, D.V.M., P. O. Box 2224, Elm Grove, W. Va., Veterinarian, City-County Health Dept.  
 Samuel C. Hawn, P. O. Box 1018, Orlando, Fla., Senior Sanitary Officer, Orange County Health Dept.  
 Frank L. Kelley, 2200 Main St., Parsons, Kan., Sanitarian, Grade I, Labette County Health Dept.  
 M. L. Kieffer, Bldg. No. 8, Vanderbilt University, Nashville, Tenn., Sanitarian  
 J. E. Klemm, 128 N. Park St., Wheeling, W. Va., Milk Sanitarian, State Health Dept.  
 Cornelius W. Kruse, M.S., 2708 Beethoven Ave., Baltimore 7, Md., Assoc. Professor of Sanitary Engineering, School of Hygiene and Public Health, Johns Hopkins University  
 Robert W. Lindenstruth, D.V.M., Box 201, Rolla, Mo., Sanitarian, Rolla and Phelps County Health Dept.  
 Edward W. Munson, 15 Oak St., Salinas, Calif., Chief Inspector, Monterey County Health Dept.  
 Major Alexander Stuart O'Hara, 307 Main St., North, Kenora, Ont., Canada, Provincial Sanitary Inspector, Dept. of Health of Ontario  
 Ralph C. Palange, M.S., U. S. Public Health Service, Water Works Park Filtration Plant, Detroit 14, Mich., Sanitary Engineer  
 William W. Payne, 1328 Oakum Ct., Willow

Run Village, Mich., S.A. Sanitary Engineer (R), U. S. Public Health Service  
 Ralph C. Pickard, M.P.H., 1736 Broadway, Ann Arbor, Mich., Student, School of Public Health, University of Michigan  
 John L. Sadowski, Room 62, Municipal Courts Bldg., St. Louis, Mo., Public Health Engineer, St. Louis Health Division  
 William W. Sampson, Ph.D., School of Public Health, University of California, Berkeley 4, Calif., Instructor and Sanitarian  
 Edgar T. Staton, Box 489, Gainesville, Ga., Sanitarian, Hall County Health Dept.  
 Clarence I. Sterling, Jr., 499 Pennsylvania Ave., N.W., Washington, D. C., Chief Engineer and Assoc. Director, Division of Health and Sanitation, Institute of Inter-American Affairs  
 August J. Szabo, P. O. Box 1872, Monroe, La., Public Health Engineer, State Dept. of Health

#### *Industrial Hygiene Section*

Erwin C. Binstadt, M.D., 4701 Marburg Ave., Cincinnati 9, Ohio, Medical Director, The Cincinnati Milling Machine Co.  
 Ernest W. Brown, M.D., Ph.D., American Medical Assn., 535 N. Dearborn St., Chicago, Ill., Executive Officer for Committee on Scientific Development, Council on Industrial Health  
 E. Kern Linder, M.D., The Atlantic Refining Co., 260 S. Broad St., Philadelphia, Pa., Medical Director  
 Rosedith Sitgreaves, M.A., 411 W. 116th St., Johnson Hall, New York 27, N. Y., Asst. Statistician, Industrial Hygiene Division, U. S. Public Health Service  
 George C. Stoecker, 1722 N. 18th Ave., Melrose Park, Ill., Industrial Hygiene Chemist, American Can Co.  
 Gerald S. Wellman, 1208 Hanna Bldg., Cleveland 15, Ohio, Personnel Director, Oglebay Norton and Co.

#### *Food and Nutrition Section*

John N. Buker, D.V.M., 55 Shattuck St., Boston, Mass., Student, School of Public Health, Harvard University  
 Joan M. Koch, M.S., Oneida, Ky., Nutritionist, State Dept. of Health  
 Josef Masek, M.D., IV, Interni Klinika, Praha II-499, Czechoslovakia, Asst. Professor of Medicine, University of Charles  
 Justo Marco Romero, M.D., 1100 E. Huron, Ann Arbor, Mich., Asst. Director, Health Center of Rimac, Lima, Peru  
 Max Schubert, City Laboratory, Wellington, Kan., Sanitarian

John Tehie, 276 N. Bellefield Ave., Pittsburgh, Pa., Food Technician, H. J. Heinz Co.  
 Lester J. Teply, Ph.D., Chemistry Dept., Columbia University, New York 27, N. Y., Nutrition Chemist  
 Irene H. Wolgamot, M.A., 809 S. Pitt St., Alexandria, Va., Director, Nutrition Service, Eastern Area, American Red Cross

#### *Maternal and Child Health Section*

Lloyd G. Combes, M.D., Box 437, Holden, W. Va., Clinician, Logan County Health Dept.  
 Guillermo Fonseca-Rojas, M.D., M.P.H., Carrera 5 #6-41, Bogota, Colombia, S. A., Director of Hygiene Center, Monteria  
 Irving Kowaloff, M.D., 7 Groton St., Forest Hills, N. Y., Medical Supervisor, Child Health Stations, Bureau of Child Hygiene, New York City Department of Health  
 Renee Zindwer, M.D., 4076 Washington St., Roslindale Boston Station, Mass., Student, School of Public Health, Harvard University

#### *Public Health Education Section*

Edwin W. Barrett, 4628 Dexter, Fort Worth, Tex., Health Education Consultant, Dept. of Public Health and Welfare  
 Jason N. Calhoun, 1017 Oakland, Ann Arbor, Mich., Student, School of Public Health, University of Michigan  
 Bernard I. Diamond, 750 Riverside Drive, New York 31, N. Y., Public Relations, Bendix Aviation Corp.  
 Franklin G. Ebaugh, M.D., 4200 E. 9th St., Denver, Colo., Professor of Psychiatry, University of Colorado  
 Rachmiel Forschmiedt, 6757 37th Ave., S.W., Seattle 6, Wash., Sanitarian, Seattle Dept. of Public Health  
 Nadine B. Geitz, M.A., 227 Riverside Drive, New York 25, N. Y., Field Supervisor, New York City Dept. of Health  
 Allen G. Kavner, M.A., 169 Van Houten St., Paterson, N. J., Health Education Director, Passaic Co. Tuberculosis and Health Assn., Student, School of Public Health, Columbia University  
 Mrs. Bhanu Kanchanlal Parikh, 40 C. Ridge Road, Malabar Hill, Bombay, India, Student, School of Public Health, University of Michigan  
 Agnes H. Parke, 303 W. Roma Ave., Phoenix, Ariz., Sanitarian, Maricopa County Health Unit  
 Dell N. Ross, Ph.D., 6 West Hillcrest Ave., Havertown, Pa., Health Officer, Haverford Township Board of Health

Henry W. Seymour, 326 Locust St., Akron 3, Ohio, Health Education Secretary, Summit County Tuberculosis Assn.

H. Duncan Simmons, Box 422, Albuquerque, N. M., Secretary-Treasurer, New Mexico Restaurant Assn.

Virginia Stone, M.A., R.N., 5508 Queensbury Rd., Richmond 21, Va., Asst. Director, Disaster Nursing, National Hqs., American Red Cross

Raymond A. Swink, M.A., 690 Union Central Annex, Cincinnati 2, Ohio, Exec. Secy., Academy of Medicine of Cincinnati

Carl C. Thompson, 111 West Mulberry, Enid, Okla., State Representative, National Foundation for Infantile Paralysis

G. Bernell Williams, 215 Red Cross Bldg., Detroit 1, Mich., Health Educator, Tuberculosis and Health Society of Wayne County

#### *Public Health Nursing Section*

Martha D. Adam, 315 West 19th St., New York 11, N. Y., Educational Director, Community Service Society

Sylvia Behr, 2528 Foster Ave., Brooklyn 10, N. Y., Community Nursing Service, New York City Dept. of Health

Eleanor Bensen, R.N., 663-49th St., Brooklyn 20, N. Y., Public Health Nurse, New York City Dept. of Health

Lena Bierdeman, Box 96, Anchorage, Alaska, Public Health Nurse, Territorial Dept. of Health

Edna J. Brandt, State Dept. of Health, Smith Tower, Seattle, Wash., General Advisory Public Health Nurse

Winifred Cole, 522 Cass, Saginaw, Mich., Director, Visiting Nurses Assn.

Adele Didricksen, R.N., 231 Albany Ave., Kingston, N. Y., Director of Public Health Nursing, Ulster County Dept. of Health

Gwendolyn M. Foulkes, R.N., 531 West 143rd St., New York 31, N. Y., Student, New York University

Alice G. Gates, R.N., 3919 John R, Detroit 1, Mich., Asst. Consultant in School Nursing, Detroit Dept. of Health

Alice J. Huisenfeldt, M.S.P.H., 1418 E. Superior St., Duluth, Minn., School Public Health Nurse, Duluth Board of Education

J. Maxwell Jennings, D.O., 104 Portage St., Kalamazoo, Mich., Health Officer, Comstock Township

Ruth Lehman, 1650 Grand Concourse, New York, N. Y., Asst. Director of Nurses, Lehman Hospital

Ethel C. Litter, R.N., Health Dept., Court House, Albany, Ore., Supervising Public Health Nurse, Linn County Health Dept.

Lucille C. Malouche, R.N., 156 East 116th St., New York 29, N. Y., Student, New York University

B. Emmeline Moore, 106½ E. 9th St., Winfield, Kan., Public Health Nurse, Joint Board of Health

Lillian E. Nelson, Box 96, Anchorage, Alaska, Public Health Nurse, Territorial Dept. of Health

Juanita A. Outlaw, 2539 Porprew Ave., Norfolk, Va., Director of Nurses, Norfolk Community Hospital

Zillah T. Pechin, 505 South Pine St., Florence, Ala., Chief Nurse, Industrial Medical Service, Tennessee Valley Authority

Vita A. Piraro, 60 West 10th St., New York 11, N. Y., Student, New York University

M. Sue Rheinlander, R.N., 1317 11th Ave., Apt. 8, Greeley, Colo., Intern, Public Health Nursing, Weld County Health Dept.

Wilhelmina H. Roulet, 132 E. 45th St., New York 17, N. Y., Field Worker, New York Visiting Nurse Assn.

Charlotte K. Schoen, 19 Eldert St., Brooklyn 7, N. Y., Student, New York University

Eula M. Spohn, R.N., 801 Lindenwood, Topeka, Kan., Staff Nurse and Advisor, Topeka City-Shawnee County Health Dept.

Marion J. Willis, R.N., 1511 University Ave., Boulder, Colo., Student, University of Colorado

#### *Epidemiology Section*

Dr. Juan F. R. Bejarano, Bulnes 1251, Buenos Aires, Argentina, S. A., Epidemiologist, Sanidad Militar

Jenin Cheng, M.B., Ph.D., 55 Shattuck St., Boston, Mass., Student, School of Public Health, Harvard University

Donald S. Martin, M.D., M.P.H., Duke Hospital, Durham, N. C., Professor of Preventive Medicine and Public Health, Duke University School of Medicine

Edwin G. Riley, M.D., Ph.D., State Board of Health, Jacksonville, Fla., Epidemiologist

Oswald H. Robertson, M.D., 950 East 59th St., Chicago 37, Ill., Formerly Director, Commission on Air-Borne Infections, U. S. Army Epidemiological Board, Surgeon General's Office

#### *School Health Section*

Ellis H. Champlin, M.S., State Education Dept., Albany 1, N. Y., Acting Director, Division of Health and Physical Education

Jacobus J. Dalmeijer, M.D., le Helmersstraat 17, Amsterdam, Holland, Director of Child Hygiene, Municipal Health Service

Ella F. Harris, M.D., 448 Highland Ave., Orange, N. J., Asst. Professor, Dept. of Health Education, New York University  
 John B. Lynch, M.D., 660 Columbia Rd., Dorchester 25, Mass., Medical Inspector, Boston Health Dept.  
 Leona I. Rice, R.N., 230 Glen Ave., Port Chester, N. Y., School Nurse, Horace Mann-Lincoln School, New York City

#### *Dental Health Section*

M. Michael Cohen, D.M.D., 520 Beacon, Boston, Mass., Dentist  
 Katheryne B. Gardner, 130 South American, Stockton, Calif., Dental Hygienist, San Joaquin Local Health District  
 Ashley W. Lindsay, D.D.S., West China Union University, Chengtu, Szechwan, China, Dean of Dentistry  
 Mabel C. McCarthy, 733 Iranistan Ave., Bridgeport 5, Conn., Supervisor, Dental Hygiene Division, Bridgeport Schools  
 Albert J. Soucek, D.D.S., 4019 Xerxes Ave., South, Minneapolis 10, Minn., Student, School of Public Health, University of Minnesota  
 Peter J. Warrén, D.D.S., 14805 Detroit Ave., Lakewood 7, Ohio, Member, Ohio State Dental Society

#### *Unaffiliated*

H. Martin Baker, M.A., 1003 Schweiter Bldg., Wichita, Kan., Exec. Secy., Sedgwick County Medical Society  
 Alta H. Bauchmann, 30 Colonial Court, Brooklyn 9, N. Y., Student, New York University  
 Edwin M. Kingery, 406 Sixth Ave., Des Moines 9, Iowa, Exec. Secy., Polk County Medical Society  
 R. Lomax Wells, M.D., 722-12th St., N.W., Washington 5, D. C., Medical Director, The

Chesapeake and Potomac Telephone Companies

Herman J. White, 184 Columbus Ave., New York 23, N. Y., Registrar, Interim Commission, World Health Organization  
 Dr. Huanwen Yui, 63 Lane 877 Avenue Foch, Shanghai, China

#### DECEASED MEMBERS

James C. Boland, M.D., Troy, N. Y., Elected Member 1936, Epidemiology Section  
 Cathlena A. Cooper, Syracuse, N. Y., Elected Member 1940, Public Health Nursing Section  
 Adah L. Hershey, R.N., Des Moines, Iowa, Elected Member 1920, Elected Fellow 1934, Public Health Nursing Section  
 William Hogan, Pasadena, Calif., Elected Member 1947, Engineering Section  
 John H. Law, M.D., Detroit, Mich., Elected Member 1946, Unaffiliated  
 Walter S. Lay, M.D., Hamden, Conn., Elected Member 1941, Health Officers Section  
 P. P. McCain, M.D., Sanatorium, N. C., Elected Member 1924, Unaffiliated  
 Samuel Morris, Ph.D., St. Thomas, Virgin Islands, U.S.A., Elected Member 1945, Unaffiliated  
 Charles A. O'Quinn, M.D., Perry, Fla., Elected Member 1940, Health Officers Section  
 Horatio N. Parker, Jacksonville, Fla., Elected Member 1900, Charter Fellow 1922, 40 year member 1940, Food and Nutrition Section  
 Ara N. Sargent, M.D., Salem, Mass., Elected Member 1918, Unaffiliated  
 Walter Schilling, M.D., San Francisco, Calif., Elected Member 1947, Vital Statistics Section  
 Sam Sparhawk, M.D., Chehalis, Wash., Elected Member 1946, Health Officers Section

#### *A.P.H.A. Membership Directory*

Copies of the Membership Directory of the American Public Health Association are still available to members on request.

## EMPLOYMENT SERVICE

The following pages present information for those seeking qualified public health personnel and for those seeking positions in public health.

This is a service of the Association conducted without expense to the employer or employee.

Address all correspondence to the Employment Service, A.P.H.A., 1790 Broadway, New York 19, N. Y., unless otherwise specified.

### POSITIONS AVAILABLE

(Supplemental to list in March Journal)

**Wanted: District Public Health Officers** for Washington State Department of Health. Required: M.D., internship, 3 years' experience in professional medical work (or M.P.H. and one year's medical experience). Beginning salary: \$6,000. Maximum beginning salary: \$7,140 (for those with additional experience in public health work). Write Robert G. Beaumier, Administrative Officer, Division of Central Administration, Washington Dept. of Health, Smith Tower, Seattle 4, Wash.

**Wanted: Assistant District Public Health Officers.** Required: M.D., internship, one year's experience in professional medical work. Beginning salary: \$5,520. Beginning salary. \$5,760 (for those with M.D. and M.P.H. degrees and internships). Write Robert G. Beaumier, Administrative Officer, Division of Central Administration, Washington Dept. of Health, Smith Tower, Seattle 4, Wash.

**Wanted: Industrial Engineer.** \$3,840 to begin. Minimum 3 years' experience in Industrial Hygiene Engineering. College graduate with major in Engineering, preferably supplemented with graduate work in Industrial Engineering. Permanent. Write Mr. A. T. Johnson, Personnel Officer, Oregon State Board of Health, 1022 S.W. 11th Avenue, Portland 5, Ore. Phone ATwater 9233.

**Wanted: Experienced public health nurse** capable of supervising several nurses in three counties and formulating efficient programs for school, MCH, TB (generalized program). Starting salary \$225 per month plus 7½¢ per mile for travel. Write Robert F. Sayre, M.D., Director, Columbia County Health Department, Lake City, Fla.

**Wanted: Sanitary officer, or sanitarian,** experienced in public health work capable of formulating and directing a sanitary program for a three-county district. Starting salary \$210 per month plus 7½¢ per mile for travel. Write Robert F. Sayre, M.D., Director, Columbia County Health Department, Lake City, Fla.

**Wanted: Nutrition Supervisor.** Position covered by state merit system. Qualifications: Training: One year graduate study in nutrition and related subjects. Experience: Four years' experience as a nutritionist; or two years' experience as a nutritionist plus four years' experience as an extension specialist in food and nutrition, or as a dietitian in a position involving adult education; or an equivalent combination of experience and training. Salary: \$3,600-\$4,320 plus travel allowance for field expenses; car furnished or 6¢ per mile. Write Director, Bureau of Maternal and Child Health, Michigan Department of Health, Lansing 4, Mich.

**Wanted: Commissioner of Public Health** to serve county of 20,000 persons. Adequate salary. Must have New York State Grade A requirements. Write Dr. Ward L. Oliver, c/o Schoharie County Board of Health, Cobleskill, N. Y.

**Wanted: Public Health Nurse;** salary \$2,001 which includes a cost of living bonus. Apply Columbia County Dept. of Health, 612 Warren Street, Hudson, N. Y.

**Wanted: Dental Hygienist;** salary \$2,070 which includes a cost of living bonus. Apply Columbia County Dept. of Health, 612 Warren Street, Hudson, N. Y.

**Wanted: Head of Maternal and Child Hygiene and Crippled Children's Section** of the Division of Preventive Medical Services; western state health department. Requirements: M.D. (approved school), approved 1 year internships, M.P.H., 1 year of graduate training and experience in pediatrics and/or obstetrics and 2 years' maternal and child health or crippled children's work in public health agency. One year of public health experience may be substituted by one additional year of graduate training. Beginning salary \$6,000, maximum salary, \$7,140. Write Box C-1, Employment Service, A.P.H.A.

**Wanted: Laboratory Technician** with clinical laboratory experience, with or without completed formal academic training, for routine duties (hematology,

chemistry, serology) and assistance in research. Large teaching hospital. Midwest. Write Box G-1, Employment Service, A.P.H.A.

**Wanted:** Supervisor for demonstration area, in Richmond, Va., to head up amalgamated nursing services of school, health department and I.V.N.A. Must have degree with major in public health nursing including preparation in supervision, administration and personnel guidance; experience in an official generalized program which included school nursing and/or experience in a generalized program in a nonofficial agency which included school nursing. Apply to M. Viola Hahn, Chairman, Inter-agency Public Health Nursing Committee, 223 South Cherry Street, Richmond, Va.

**Wanted:** M.D. with public health training and experience for new Bi-County Health Department, Southeastern Illinois. Combined population—approximately 35,000. Minimum budget provides for \$1 per capita. Health Department offices in both counties. Salary \$7,200 plus \$75 monthly for travel. Write to Roland R. Cross, M.D., Director, Illinois Dept. of Public Health, Springfield, Ill.

**Wanted:** Health Officer for county health department in central Illinois. Department established on temporary basis during the war, has now been made permanent. Staff of eleven. Budget approximately \$50,000, population 45,000. Active community support. Salary \$7,200 plus travel allowance. Write to Roland R. Cross, M.D., Director, Illinois Dept. of Public Health, Springfield, Ill.

**Wanted:** Director of Public Health Nursing Association, with qualifications to meet minimum N.O.P.H.N. standards for director. Salary open. Write Acting Director, Public Health Nursing Association, City Hall, Des Moines, Ia.

**Wanted:** Field Nursing Supervisor with B.S. in public health nursing, generalized experience and must have had university course in supervision. Prefer nurse experienced as student field teacher. Salary range \$190-\$220. Write Acting Director, Public Health Nursing Association, City Hall, Des Moines, Ia.

**Wanted:** Public Health Nurses for generalized nursing program. P.H.N. certificate required or its equivalent in advanced study. Salary \$157-\$209; 42 hour week. Retirement plan. One month vacation with pay. Write Acting Director, Public Health Nursing Association, City Hall, Des Moines, Ia.

**Wanted:** Bacteriologist, young man,

in industrial consulting laboratory in large midwestern city. Preferred training: bacteriology major, chemistry minor. Experience in industrial or sanitation work desirable but not necessary. Duties include laboratory analyses, some field work. Promotional analyses, some field work. Promotional opportunities. Salary \$150 or more, depending entirely on qualifications. Write Box D-1, Employment Service, A.P.H.A.

**Wanted:** Veterinarian qualified to do meat inspection work. Salary \$3,000 to start. Write L. C. Neer, D.V.M., Acting Health Commissioner, Health Department, City Hall, Middletown, Ohio.

**Wanted:** Two supervisors for public health nurses in a city-county health department, generalized nursing program. Civil Service. Salary \$2,400-\$2,820, plus mileage. Maximum salary reached in three year period. Must have had adequate experience in field work supervision and a degree in Public Health Nursing preferred. Write Dr. George A. Denison, Box 2591, Birmingham, Ala.

**Wanted:** Public Health Nurses for generalized nursing program. Salary range \$225-\$255 per month. Under Civil Service, 40 hour week, vacation and sick leave privileges. Write Director of Public Health Nursing, City of Seattle, 504 County-City Building, Seattle 4, Wash.

**Wanted:** Two well-qualified staff public health nurses in Clatsop County. Salary \$225 per month plus travel. Write Miss Aileen Dyer, Director, Public Health Nursing Section, 1022 S.W. 11th Avenue, Portland, Ore.

**Wanted:** Staff Nurses for 250 bed tuberculosis hospital; 40 hour week. Salary \$210 per month; \$30 deducted if maintenance is desired. Opportunity for postgraduate work with university credit. Apply Director of Nursing Service, Firland Sanatorium, Richmond Highlands, Wash.

**Wanted:** School Dentist, white. Salary range \$3,600-\$4,500, starting salary depending on experience. Write Health Officer, Health Center, Alexandria, Va.

**Wanted:** X-Ray Technician, white. Salary range \$2,000-\$2,400, starting salary depending on experience. Write Health Officer, Health Center, Alexandria, Va.

**Wanted:** Graduate Sanitary Engineer to head division and supervise two sanitarians. Permanent position. Must be trained in water and sewage treatment plant sanitation. Beginning salary \$3,120.



Write Will County Health Department, 21 E. Van Buren Street, Joliet, Ill.

**Wanted: Health Coordinator**, to work under social welfare council with boards of health, community agencies and schools in 5 neighboring suburban communities; commuting district of metropolitan New York. Total population 186,000. Training and experience in health education and community organization desired. Write Box E-1, Employment Service, A.P.H.A.

**Wanted: Physicians, dentists, nurses and engineers** to work in medical care and preventive programs for migratory farm workers in various areas of the U. S. Salaries and status depend on training and experience. For further information write Box F-1, Employment Service, A.P.H.A.

**Wanted: Well-qualified full-time health officer** to organize new midwestern city-county health department. Maximum starting salary \$8,000, depending on training and experience. Excellent community interest and support. Write Box H-1, Employment Service, A.P.H.A.

**Wanted: Bacteriologist** in state branch laboratory, New York State. Required: college degree with specialization in bacteriology and three years' pertinent experience; or 1 year graduate study and 1 year experience. Civil Service, no residence requirement. Beginning salary \$2,400, advancement possible. To work under moderate supervision. Write Box J-1, Employment Service, A.P.H.A.

**Wanted in Northwestern State Health Department:** (1) Epidemiologist and Deputy State Health Officer; (2) Director of the Division of Maternal and Child Health; (3) Director of the Division of Tuberculosis Control. Salary \$5,400 to \$6,600 depending on training and experience. Write Box M-1, Employment Service, A.P.H.A.

**Wanted: Physician** for full-time industrial position in established company, Eastern Pennsylvania. Candidates must be graduates of recognized medical school, preferably with previous industrial and surgical training and/or experience. Should be desirous of entering the industrial field on a permanent basis. Preference for men under 35. Starting salary approximately \$7,500 annually. Write Box K-1, Employment Service, A.P.H.A.

**Wanted: Sanitary Engineer and Sanitarians** for Division of Public Health Engineering in Southern Health Department. Entrance salary contingent on experience and previous earnings. En-

gineering duties consisting of water, sewage, food, milk, and general sanitation. Some construction and design experience preferred. Engineer to serve as assistant to chief of division. One sanitarian to serve in technical capacity on milk sanitation. Knowledge and experience in both field and laboratory necessary. Another sanitarian to serve in the capacity of rodent control supervisor. It is preferred that this individual have training and experience by the U. S. Public Health Service or the equivalent thereof. It is necessary that the engineer and milk sanitarian hold a degree in their respective fields, or several years experience in addition to 2 years of formal academic training. Write Box U-3, Employment Service, A.P.H.A.

**Wanted: Public Health Staff Nurses** for well-established health department in California. Generalized service in urban and rural areas to approximately 200,000 people. Starting salary \$2,640 annually with adjustments based on experience. Retirement provided. Cars furnished. Applicants must be eligible for nurse registration in California. Headquarters 80 miles from San Francisco. Write Box R-1, Employment Service, A.P.H.A.

**Wanted: Education Supervisor** for Visiting Nurse Association in city 15 miles from New York. Agency receives affiliating university students for 3 months field work in public health nursing during early part of 2 semesters annually. Write Box P-1, Employment Service, A.P.H.A.

**Wanted: Sanitarian** for Metropolitan County Health Department in area of Detroit, Mich. for general sanitation program. Must furnish own transportation. Salary \$3,090 to \$3,570. Mileage at 7¢ per mile. Retirement plan. Apply Wayne County Health Department, Eloise, Mich.

**Wanted: Public Health Nurses** for generalized nursing program. Salary range \$2,200 to \$2,800 per year, depending upon experience and education. Must have own car. Mileage allowance up to \$700 per year. Forty-two hour week. Full-time county health department with supervising nurse. Population 60,000, 60 per cent rural. Attractive resort area. Excellent opportunity to study nutritional problems in conjunction with U. S. Public Health Service nutrition survey here. Apply Director, Ottawa County Health Department, Grand Haven, Mich.

**Wanted: Director of the Sanitation Division**, St. Louis County Health De-

partment. Required: graduation with an engineering degree from an accredited school; master's degree in sanitary engineering, public health, or equivalent from an accredited school; at least 4 years experience within the past 8 years in the field of public health engineering, 2 of which must have been in a responsible supervisory capacity. Salary \$3,600 to \$4,200 a year, plus travel. Write Health Commissioner, St. Louis County Health Department, P.O. Box 267, Clayton 5, Mo.

**Wanted: Food Chemist**, two vacancies in State Food Laboratory, Dept. of Agriculture and Markets, Albany 1, N. Y. Expected salary range \$2,928-\$3,550, including emergency compensation but exclusive of retirement deductions. Work consists of chemical, physical and micro-analytical examinations of foods to determine their conformity to Pure Food Laws. Candidates should have 2 years of qualifying experience after obtaining a B.S. in chemistry, and must satisfy requirements of Civil Service Commission. Date for written examination to be announced soon. Communicate with A. H. Robertson, Ph.D., Director, Food Laboratory, State Dept. of Agriculture and Markets, State Office Building, Albany 1, N. Y.

**Wanted: Health Officers** with experience or training in public health for county health units as follows: Columbia-Hamilton-Gilchrist Counties, Lake City; Gadsden-Liberty-Calhoun Counties, Quincy. Also, Medical Director for Bureau of Maternal and Child Health, with headquarters in Jacksonville. Salaries dependent upon training and experience. Liberal mileage allowances. Write State Health Officer, P.O. Box, 210, Jacksonville, Fla.

**Wanted: Associate Bacteriologists** thoroughly experienced in clinical

methods to take charge of state-wide clinical laboratory program. Central Laboratory, Baltimore, Md.

**Two Associate Bacteriologists** for general medical-public health laboratory work in branch laboratories.

**Assistant Bacteriologist** for general medical-public health work for branch laboratory at Cumberland, Md.

All positions under State Merit System. Make application to Dr. C. A. Perry, 2411 N. Charles Street, Baltimore 18, Md.

**Wanted: Physician** for position of Assistant Chief, Division of Child Hygiene, Ohio Department of Health. Salary \$5,500-\$6,000. Must be graduate of approved medical school, have 1 year's internship and at least 1 year of graduate training, plus 1 year of training or experience in clinical pediatrics. Experience in maternal and child health desirable. Must be licensed in Ohio or eligible for licensure. Apply Chief of Division of Child Hygiene, Department of Health, State Departments Building, Columbus 15, Ohio.

**Wanted: Occupational Therapist** for half time at Potts Memorial Institute and half time at Columbia Sanatorium, both in Columbia County. Salary \$2,400. Please apply to Dr. H. A. Pattison, Director, Potts Memorial Institute, Livingston, N. Y.

**Wanted: Senior Nurse**, to take charge of nursing staff of five; small city-county health department, Ohio. Headquarters 20 miles north of Columbus; college town. Requirements: certificate in public health or one year public health training in approved school plus two years' public health experience. Salary \$2,420 plus mileage paid by Ohio State Health Department. Civil Service. Write Alexander Witkow, Health Commissioner, Delaware Health Department, Delaware, Ohio.

### POSITIONS WANTED

**Female Chemist**: Single, 26, 3½ years, industrial chemical experience, desires library research or technical writing position. New York, Philadelphia, Trenton or other areas within commutable distance to Trenton. Write Box L-512, Employment Service, A.P.H.A.

**Bacteriologist - Parasitologist, M.D., M.S., C.P.H.**, 2 years research, 7 years teaching, 7 years public health work, numerous publications chiefly on intestinal microorganisms, is seeking responsible position in research, public health laboratory or teaching. Write Box L-518, Employment Service, A.P.H.A.

**Bacteriologist, B.S.** Experience: State Health Dept. 5 years, recent laboratory officer and instructor in bacteriology, Sanitary Corps, A.U.S. 2½ years. Write Box L-520, Employment Service, A.P.H.A.

**Veterinarian** chiefly interested in food control (D.V.M. 1940, M.P.H. expected June 1947); seeks position in field of food and drug administration or in food industry (laboratory or advisory). Experience: 2 years' animal disease control work (U. S. Dept. of Agriculture), 1 year meat inspection (Government), 4 years' food control and sanitation (U. S. Army

Veterinary Corps). Write Box V-300, Employment Service, A.P.H.A.

Health Educator, Negro, with Bachelor's and master's degrees in Public Health. Now professor of Health Education in Class A college. Desires position with state or local health organization or other agency in the East or Middle West. Write Box H-528, Employment Service, A.P.H.A.

Engineer, 31 years old, B.S. (C.E.), M.S. (Sanitary Engineering), nine years' experience in public health engineering with state health department, research and teaching in school of public health and school of engineering, desires position on the teaching staff of school of public health or school of engineering, or as public health engineer in state or local health department. Write Box E-505, Employment Service, A.P.H.A.

Negro dental student will graduate in June, holds both B.S. and M.S.P.H. degrees. Seven years of educational and administrative experience. Veteran of World War II. Desires a full-time job with either a State, County, or City Health Department in Dental Education or as a School Dentist. Thirty-four years old. Write Box D-20, Employment Service, A.P.H.A.

Health Educator, trained and experienced in the use of the various media—radio, speakers' bureau, publications, publicity, exhibits. Record of successful

work in community organization, and in planning and directing mass x-ray programs. Write Box H-530, Employment Service, A.P.H.A.

Nutritionist with some hospital dietetic experience and experience in food research and university lecturing for 3 years, desires position as nutritionist in public health department, social agency or health unit in the U. S. Canadian citizen. Write Box N-415, Employment Service, A.P.H.A.

Physician, former Health Unit Director, considerable administrative experience, industrial experience during the war. Seeks part-time position in health work on administrative or clinical basis or as preemployment, school or insurance examiner. New Orleans area. Write Box A-518, Employment Service, A.P.H.A.

Nutritionist, M.S. (nutrition). Experience: State health Department 6½ years, federal agency 1½ years, hospital dietitian 5 years. Write Box N-400, Employment Service, A.P.H.A.

Ph.D., male. Twelve years' experience in teaching and independent research in parasitology, immunology, and bacteriology at university medical schools and research laboratories, desires responsible position in teaching or research institution, governmental agency or industry. Write Box M-473, Employment Service, A.P.H.A.

### U. S. Public Health Service Announces Examinations for Nurses

Examinations for the appointment of registered nurses to the U. S. Public Health Service will be given during March and April, 1947, in cities throughout the nation, according to an announcement made by Miss Lucile Petry, Chief of the Division of Nursing.

"The Public Health Service offers opportunities for recent graduates as well as experienced nurses," Miss Petry said.

"For the new registered nurse who can qualify here is an opportunity to acquire good initial experience. The Public Health Service offers the experienced nurse a permanent career with the advantages of professionally stimulating work, job security, regular salary increases, and opportunities for advanced study and promotion on the basis of training and ability."

Nurses interested in obtaining further details concerning appointment to the U. S. Public Health Service should write

to Miss Lucile Petry, Chief, Division of Nursing, U. S. Public Health Service, Washington 25, D. C. Specific dates for examinations will be announced shortly.

### Fellowships for Physicians and Engineers

The Surgeon General announces that applications for Fellowships in post-graduate public health training for physicians and engineers, for the school year beginning in the fall of 1947, will be received prior to May 1, 1947. The Fellowships are made possible through a grant given by the National Foundation for Infantile Paralysis.

The Fellowships include nine months of training in an accredited school of public health or an acceptable school of sanitary engineering followed by three months of field training.

Requirements: Under 45 years of age, United States citizenship. Physicians must have completed at least one year's internship. Engineers must have a bachelor's or higher degree in sanitary, civil, or chemical engineering, or another

engineering degree with experience in public health or sanitary engineering.

The Fellowships are intended for newcomers to the public health field and are not open to employees of state or local health departments for whom federal grant-in-aid funds are already available to the states. The purpose of the Fellowships is to aid in the recruitment of medical and engineering personnel to help fill hundreds of vacancies existing in state and local health departments throughout the country.

The Fellowships are administered by the Surgeon General's Committee on Training of Public Health Personnel. Applicants may secure further details by writing to The Surgeon General, U. S. Public Health Service, 19th and Constitution Ave., N.W., Washington 25, D. C.

### Public Health Career Opportunities in New York State

Examinations open to residents and non-residents of New York State will be held in May to fill over 20 positions of Assistant District Health Officer and Senior Public Health Physician (Tuberculosis Control): beginning salary \$4,620 with annual increments to \$5,720. An unwritten examination is also scheduled for Assistant Director of Cancer Control with a salary range of \$6,000 to \$7,375.

Because of rapidly expanding programs,

opportunities for promotion to positions with salaries ranging from \$6,000 to \$7,375 will be unusually good after one year's service as Assistant District Health Officer or Senior Public Health Physician (Tuberculosis Control). After further experience members of the staff are eligible for positions paying from \$7,750 to \$9,250 and also for county and city positions paying, in some cases, higher salaries. State service carries with it one month's vacation annually, liberal sick leave, and participation in the state retirement plan.

Qualifications for all positions include citizenship; graduation from a medical school approved by the American Medical Association; license or eligibility for license to practise medicine in New York State; one year's satisfactory internship or equivalent; successful completion of a postgraduate course in public health of one academic year in residence, approved by the New York State Public Health Council; and at least 6 months' satisfactory, full-time experience in a responsible public health position. Experience may be substituted for the postgraduate course in public health. Additional specialized experience is required for the positions of Assistant Director of Cancer Control and Senior Public Health Physician (Tuberculosis Control).

For details write to State Department of Health, Albany 1, New York.

## Advertisement

## Opportunities Available

WANTED—(a) Director, student health department; fall appointment; coeducational institution, approximately 4,000 students; East. (b) Physician with extensive experience in medical society work to serve as executive officer of state medical society; preferably someone around fifty or under. (c) Student health position, liberal arts college; Middle West; apartment or home available. (d) Director of health, public school system; enrollment of 20,000; 800 employees; staff of 12 nurses, two dentists, several oral hygienists; preference for physician who has specialized in pediatrics or public health. (e) Director of student health; duties consist of coordinating medical, health, and physical education services; women's college of approximately 1,200 students; South. (f) Well trained and experienced public health officer to join staff of city health department; Pacific Coast; \$7,200. (g) Medical officer; master's degree in public health and some experience, preferably with rural health program; key position requiring administrative ability; \$7,000; Latin America. PH4-1 Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago 11.

WANTED—(a) Health educator qualified to serve as consultant to health educators on staff of state department of health; Ph.D. whose training has included year of graduate training in field of public health with major emphasis on education required; \$3,600–\$4,800. (b) Sanitary engineer to join division of engineering and sanitation of county department of health; headquarters in large metropolis; Middle West; \$3,000–\$3,500. (c) Health educator to become associated with Chicago agency; master's degree in public health education desirable; \$3,500. (d) Sani-

tary engineer; duties consist of serving in advisory capacity in general overall sanitary and anti-malarial work of large, industrial company; preferably someone free to travel. (e) Health educator; state department of health; general community health education program; preferably someone who has majored in physical education; Master's degree in public health with major in public health education; South. PH4-2 Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago 11.

WANTED—(a) Several public health staff nurses; state organization of 100,000; opportunity for obtaining additional training; \$175–\$215. (b) Assistant professor of public health nursing; duties include service as educational director of city public health service and supervising students for field experience in public health nursing; degree required, Master's preferred; salary dependent upon qualifications; West. (c) Senior public health nurses; duties consist of performing professional nursing services involving generalized public health nursing; work primarily concerned with improvement and maintenance of community health within prescribed areas; \$210–\$250; Pacific Coast. (d) Director, municipal public health nursing association; degree required; must be qualified to develop program; minimum three years' experience; salary dependent upon qualifications. (e) Maternity consultant; state department of health; degree, graduate training in obstetrics and supervisory experience required; Middle West. (f) Public health nurses with fluent knowledge of Spanish to undertake public health work in Argentina for period of 12–18 months. PH4-3 Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago 11.

## Opportunities Wanted

Public health physician is available for administrative appointment; Ph.B. degree and degree of doctor of medicine, eastern university; M.S. degree in Public Health Medicine; seven years' public health work which has been largely administrative; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Bacteriologist; Ph.D., several years' experience as hospital bacteriologist; four years, instructor in bacteriology, university medical school; five years, chief bacteriologist in charge of microbiology laboratories, industrial company; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Public health nursing administrator; A.B. and M.S. degrees; professionally trained in university schools; eight years' interesting experience as public health supervisor; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Health educator; B.S., M.S. and Ph.D. degrees; several years, instructor in biology, bacteriology and health; state university; three years, public health educator, city and county health department; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Nutritionist; B.S. in home economics, M.S. in nutrition; year's fellowship in nutrition during which time she completed vitamin assay of foods; several years on faculty of department of nutrition of university school of home economics; is particularly interested in abstracting nutrition studies or collaborating research findings and nutrition advertising; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Sanitary engineer is available for public health appointment; C.E., Eastern university; two years' municipal engineering including supervision of field personnel; six years, sanitary engineer with state department of health where he has obtained broad experience in all phases of environmental sanitation; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Statistician; M.A. degree (Sociological research) graduate training university school of public health (biology, bacteriology and physiology); several years' experience as statistician with state department of health; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

## NEWS FROM THE FIELD

### ALLOCATING STATE FUNDS TO LOCAL HEALTH DEPARTMENTS

State health officers have recently received from the Association's Committee on Administrative Practice a summary of formulae for allocating state funds to local health departments. Requested by the vote of the September Conference on Local Health Units, such formulae were submitted by eight states—Florida, Georgia, Illinois, Louisiana, New York, North Carolina, Tennessee, and Washington.

At least four of the states reporting—Georgia, Illinois, New York, and Tennessee—make as a condition of receiving state funds the employment of a full-time medical officer of health. Georgia's allocation formula recommends that counties of less than 50,000 population organize themselves into multicounty health districts. Illinois' formula prescribes an annual public health plan as a prerequisite to allocation of funds.

Nearly all of the eight plans submitted have provision for a graduated allocation to local departments depending on population, size of budget, or per capita wealth.

Florida's plan allocates \$1 per capita for the first 10,000 of population, decreasing the amount gradually to 15 cents for the fifth and subsequent 10,000's. This results in a 59 cent per capita allocation for a population of 50,000, 37 cents for 100,000.

Georgia's state participation ranges from 35 per cent of the budget in population units of over 100,000 to 75 per cent in those of 5,000 or less.

Illinois uses the graduated principle to the extent of adding to the standard 20 per cent of total local costs an additional amount for poorer counties based on individual need.

Louisiana allocates from two-thirds to one-sixth of the total local budget, the smallest percentage applying to budgets of \$130,000 or more. For budgets of \$61,000 the maximum state percentage is 32.

New York gives only to organized county health departments 75 per cent of the first

\$100,000 expended, 50 per cent of the amount beyond \$100,000. To cities that are not part of county health departments and to unorganized counties for special services it allocates 50 per cent of total local costs.

North Carolina has a formula based on population weighted by an index of financial need for general health services and an additional weighting for special services by an index of need.

The Washington formula provides \$3 of state money for every \$1 of local money for counties with assessed valuation of from \$300 to \$400 per capita, graduated downward to a ratio of one state to three local in counties with assessed valuation of \$1,000 or more per capita.

As other states furnish their formulae to the Committee on Administrative Practice, they will be summarized and made available to state health administrators.

### INDIANA TACKLES RURAL DOCTOR SHORTAGE

The Indiana State Medical Association has undertaken a program whereby it hopes to meet the shortage of physicians in the rural areas of the state. Through its Medical Association Council it is offering six or more scholarships each year for young men and women who wish to study medicine and practise in Indiana. Students accepting the scholarships must agree to be available for private practice in those counties of the state "in which in the opinion of the committee, medical service is most urgently needed." Applications should be made to Alfred Ellison, M.D., Chairman, Medical Association Council, South Bend, Ind.

### MORE LOCAL HEALTH SERVICE IN MICHIGAN

In the February issue of *Michigan Public Health*, the State Health Commissioner, William DeKleine, M.D., congratulates several communities of

the state for setting up or strengthening their local health departments. Among those mentioned are Macomb County, population about 110,000, which has established a health department. Delta and Menominee Counties, with a combined population of about 60,000, have organized a bi-county health department whereas previously each had had a separate health department. Chippewa County has joined the previously organized bi-county unit of Luce and Mackinac, thus making a population unit of about 45,000 persons. In congratulating these consolidating counties Dr. DeKleine said, "Your willingness to work together in maintaining consolidated health departments is worthy of high praise. I too firmly believe that 'the strength of the wolf is in the pack.'"

#### EXPANDED TEACHING PROGRAM IN INDUSTRIAL HYGIENE AT COLUMBIA UNIVERSITY

In order to meet the growing demand for trained personnel, the Columbia University School of Public Health announces courses of study for physicians, nurses, engineers, and chemists chiefly interested in the field of industrial hygiene or occupational medicine. For the academic year starting in September, 1947, properly qualified students will be accepted as candidates for the degree of Master of Public Health or Master of Science in Industrial Hygiene. The curricula will include lectures, seminars, demonstrations, laboratory exercises, and field work.

Students working toward the Master of Public Health degree will be required to take, in addition to their industrial hygiene work, courses in other public health subjects such as biostatistics, epidemiology, administration, sanitary science, and health education. Those enrolled for the Master of Science degree will be permitted to con-

centrate to a greater extent on industrial hygiene subjects.

Further information may be obtained from the Director, Columbia University School of Public Health, 600 West 168th Street, New York 32, New York.

#### POLIOMYELITIS STAFF TRAINING CONFERENCES

The American Red Cross has been conducting a series of five 2 day area staff training conferences on the subject of poliomyelitis. The purpose was to prepare staff nurses to judge nursing needs in polio outbreaks, to bring them up-to-date on procedures and available facilities, and to provide an opportunity for discussion of problems encountered in nurse recruitment and assignment. Representatives of the National Foundation for Infantile Paralysis and the Children's Bureau, and public health officials and physicians who were active in recent poliomyelitis outbreaks were present at each meeting.

The conference series followed the country's worst polio outbreaks in 30 years, for which the Red Cross recruited 2,360 nurses. The first conference was held in St. Louis, January 23-24, the most recent one in New York City, April 2-3.

#### TEXAS PUBLIC HEALTH ASSOCIATION

The 22nd Annual Meeting of the Texas Public Health Association was held in Dallas February 24-26 under the Presidency of L. P. Walter, M.D., M.P.H., of the Texas State Department of Health. More than 400 persons were in attendance. Among the out-of-state speakers were Henry F. Vaughan, Dr.P.H., Ann Arbor, Mich.; Wilson T. Sowder, M.D., M.P.H., State Health Officer, Jacksonville, Fla.; Edwin F. Dailey, M.D., U. S. Children's Bureau, Washington, D. C.; Carl E. Buck, Dr. P.H., Field Director, American Public Health Association; William T. Ingram, M.P.H., Engineering Field Associate,

A.P.H.A.; and Reginald M. Atwater, M.D., Executive Secretary, A.P.H.A.

The following officers were elected for the coming year:

*President*—Sidney W. Bohls, M.D., Austin  
*President-Elect*—Austin E. Hill, M.D., Houston  
*First Vice-President*—Faye Pannell, R.N., Dallas

*Second Vice-President*—Thomas Bartlett  
*Executive Secretary*—Earle W. Sudderth, Dallas

#### MENTAL HYGIENE DIVISION IN ARKANSAS

The 1947 Arkansas Legislative Assembly passed a law setting up a Division of Mental Hygiene in the State Board of Health. The professional personnel provided for at the outset includes a psychiatrist, a psychologist, and two psychiatric nurse social workers.

#### PAY INCREASE FOR NURSES

The Visiting Nurse Service of New York has recently reclassified all salaries on a higher scale and adopted a retirement pension system. The new classifications and their salaries are: practical nurses, \$1,700 to \$1,942 a year; professional (registered) nurses, \$2,280 to \$2,400 a year; public health nurses, \$2,520 to \$3,180 a year; supervisors, \$3,200 to \$4,200 a year.

#### COLLEGE HEALTH CONFERENCE IN MAY

Thirty-five leading organizations in health and education will sponsor the Third National Conference on Health in Colleges to be held in New York City, May 7-10, 1947. National sponsoring organizations include the Association of American Colleges, the American Association of Teachers Colleges, the American Student Health Association, the American Association for Health, Physical Education and Recreation, and the National Health Council. The proceedings of the Third National Conference on Health in Colleges will

be published in book form. For further information, address the Secretary, 1790 Broadway, New York 19, N. Y.

#### ILLINOIS DECLARES POLICY ON FOODHANDLER EXAMINATIONS

The Illinois State Health Department recently issued to its Division chiefs and district, county, and municipal health officers, a new policy statement on control measures to prevent spread of disease by foodhandlers and public or private employees.

The policy states that "it is believed that routine physical examinations as generally made have little value in control of diseases and that laboratory examination of specimens submitted in connection with these examinations has little value of a permanent nature."

In place of routine medical and laboratory examinations of all employees four measures are recommended as follows:

1. The improvement and proper use of sanitary facilities—This can best be accomplished by means of a strong sanitation program, with adequate inspection backed by a sound sanitation ordinance. Effective use of the U.S.P.H.S. standard ordinances will improve and control conditions in the food industry.

2. The provision or training in personal hygiene—This can be promoted on a general scale in the health education program by demonstration pamphlets, news releases, radio programs, and sponsored group meetings. Special group meetings with personnel of various branches of food industry, institutions, schools, etc., and special public meetings for miscellaneous groups can be arranged. Management should be impressed with the need for including health education in training programs.

3. The removal from work and treatment of persons who are obviously ill—Management and employees must be made conscious of the importance of this. Only by rigid on-the-spot action can respiratory infections, wounds, etc., be controlled. Personnel policies that encourage full cooperation will accrue to the benefit of personnel, management, and the health of the public.



4. The careful study of epidemiological factors with follow-up of convalescents and contacts—This will concentrate effort at the source of danger and eliminate the necessity of examining all persons as possible carriers.

In connection with this new statement of policy no requirement is established for initial or routine health examinations nor is mention made of specific disease. However, the following wording is suggested for all new or revised rules, regulations, or minimum requirements concerned with medical examination and health of personnel:

1. Every person employed in a maternity hospital, nursing home, milk-pasteurization plant, retail raw dairy, food establishment, etc., shall furnish such information, permit such physical examination, and submit such laboratory specimens as the department may require for the purpose of determining freedom from infection.

2. Any person with an acute respiratory infection or other acute contagious or infectious disease, or a presumably infected wound, sore or lesion shall not be permitted to work in such an establishment or to handle food or food utensils until he has a written statement from the local, county, or state health authority that he is not a disease carrier.

If the manager or superintendent suspects that any employee has contracted any disease in communicable form or has become a carrier of such disease, he shall prohibit further work by such employee and shall notify the nearest health authority immediately.

#### IN-SERVICE TRAINING COURSE FOR WATER WORKS PERSONNEL

The University of Michigan School of Public Health has announced the second in-service training course in selected technical problems for water works personnel to be held at the School of Public Health, Ann Arbor, Mich., on May 5 and 6, 1947.

The course is designed especially for water chemists of municipal and industrial water treatment plants, but others who are interested will be welcomed.

Application for enrollment should be sent to the School of Public Health

promptly. The closing date for enrollment is April 30, 1947.

#### NATIONAL SOCIETY FOR THE PREVENTION OF BLINDNESS

The National Society for the Prevention of Blindness offers a prize of \$500 for the most valuable original paper adding to existing knowledge concerning the diagnosis of early glaucoma or the medical treatment of noncongestive glaucoma. Papers may be submitted by any practising ophthalmologist of the Western Hemisphere and may be written in English, French, German, Italian, Spanish, or Portuguese. Criteria for the paper may be secured from the National Society for the Prevention of Blindness, 1790 Broadway, New York 19. Closing date for receipt of papers is December, 1947.

Papers for the prize offered in 1944 did not conform to the criteria set up by the ophthalmological committee. Hence the prize is offered again.

#### C. G. GILLESPIE RETIRES

C. G. Gillespie has retired from the position of Chief, Bureau of Sanitary Engineering, California Department of Public Health, after 28 years in state service.

He was appointed Chief in 1915, at the time of the organization of the Bureau, and is largely responsible for the development in California of a public health program in sanitary engineering. This is a long range program based on education to affect gradually improved standards and is marked by a 1946 ruling of the State Board of Health that no new permits will be issued for the disposal of raw sewage and industrial wastes into California streams, bays and ocean waters and that outstanding permits for this practice are being revoked as of January 1, 1947.

Mr. Gillespie was recently appointed Special Consultant to the Sanitation

Study Section of the National Institute of Health, which makes recommendations to the National Advisory Health Council on grants for research in the field of environmental sanitation.

DEPARTMENT OF TROPICAL MEDICINE  
AND PUBLIC HEALTH FOR  
TULANE UNIVERSITY

Plans have been announced for a Department of Tropical Medicine and Public Health at the Tulane University School of Medicine, New Orleans. The department will consist of three units: clinical tropical medicine, parasitology, and public health. Plans are for a course that will lead to a combined degree in tropical medicine and public health, the only other example of which, according to the announcement, is the London School of Hygiene and Tropical Medicine.

The new department will be headed by William A. Sodeman, M.D., who has been head of the Department of Preventive Medicine in Tulane since 1941. He is now carrying on special clinical studies in the Puerto Rico School of Tropical Medicine and will also study tropical diseases and their control in Venezuela and Panama before he takes up his duties as director of the new department, which should be in operation for the academic year 1947-1948.

FIRST POST-WAR NEW ENGLAND  
HEALTH INSTITUTE

The New England Health Institute which was discontinued during the war years will be revived during the coming summer on June 16, 17, and 18 at the University of New Hampshire, Durham. The complete program, now being arranged, will be announced at a later date. Facilities of the University will be at the disposal of those attending at an approximate rate of \$2.50 to \$3.50 per day for room and meals. Further information can be secured from H. Shirley Dwyer, D.D.S., Public Relations

Chairman, New England Health Institute, New Hampshire State Department of Health, Concord.

PUERTO RICO PUBLIC HEALTH  
ASSOCIATION

The sixth Annual Meeting of the Puerto Rico Public Health Association was held at the School of Tropical Medicine, San Juan, in February. Meetings were presided over by Angel M. Marchand, M.D., M.P.H., President. Participants included Governor Pinero of Puerto Rico, Dr. Juan Antonio Pons, Commissioner of Health of Puerto Rico, James S. Simmons, M.D., Dr.P.H., Dean of the Harvard School of Public Health, John M. Hepler, C.E., Director, Bureau of Engineering, State Department of Health, Lansing, Michigan, Dr. Alfred John Aselmeyer of the U. S. Public Health Service, and others.

The officers for the coming year include Guillermo Arbona, M.D., M.P.H., President, Rafael A. Timothee, M.D., President-Elect, and Nelson Biaggi, Secretary.

PUBLIC HEALTH NURSING WEEK

The second annual Public Health Nursing Week will be April 20-26. The observance of this week is being sponsored by the National Organization for Public Health Nursing with the co-operation of the U. S. Public Health Service and other groups. This is also the occasion of the observance of the 70th anniversary of public health nursing in the United States and the 35th anniversary of the N.O.P.H.N.

The aims of Public Health Nursing Week are:

a. To stimulate the development of organized health services in all areas of the country. At present about a third of the population is without such service.

b. To promote greater understanding of public health nursing as a service for everybody—regardless of size of income.

c. To increase citizen participation in and support of public health nursing services.

d. To recruit public health nurses by encouraging nurses already trained to enter the public health field and by interesting high school and college girls to choose this work as a career; 8,000 more public health nurses are needed immediately.

e. To help relieve pressure on hospitals by making it generally known that part-time professional nursing care is available to people at home.

The N.O.P.H.N. has prepared a kit of materials for use during Public Health Nursing Week. It gives background material, suggestions for organizing local committees, for newspaper articles, radio talks, local proclamations, discussion group material, posters, and even comics. The kit is available from the National Organization for Public Health Nursing, 1790 Broadway, New York 19, at 50 cents. Ask for "How to Observe Public Health Nursing Week in Your Community."

#### AMERICAN WATER WORKS ASSOCIATION

At its annual meeting held in Chicago on January 13, the following officers were elected to serve for 1947-1948:

*President*—N. T. Veatch

*Vice-President*—Linn H. Enslow

*Treasurer*—William W. Brush

#### ALCOHOLISM IN THE NEWS

The New York Academy of Medicine recently made a survey of facilities for the care and treatment of alcoholism in New York City (published in the *Quarterly Journal of Studies on Alcohol*, December, 1946). Upon its completion the Research Council on Problems of Alcohol, sponsored an all-day meeting in New York City at which its findings were discussed. The Academy report was summarized by Hubert S. Howe, M.D., Chairman of the Subcommittee on Treatment Facilities for Alcoholics.

Among the facts brought out were that an average of more than 11,000 cases of acute alcoholic intoxication are annually admitted to New York

municipal hospitals, that the great proportion are discharged within 24 hours after sedative and sobering procedures only, and that few social agencies of the city have any constructive program for dealing with the problem.

The recommendations of the report, carried forward in resolutions of the conference, were for continued and co-operative action of such agencies as the New York Academy of Medicine, the Greater New York Hospital Council, the State and County Medical Societies, the Governor and the Legislature, the American Hospital Association, the American Medical Association, and the American College of Surgeons, in providing adequate facilities for study of the causes of alcoholism and for the treatment and cure of sufferers from it; also in developing minimum standards for the operation of such facilities; that alcoholism be recognized as an illness and treated in inpatient and outpatient departments of hospitals, and that a further conference be called of representative citizens in order to develop the public understanding required to meet the medical, legal and social problems of inebriety.

Following closely upon the Conference, the Research Council on Problems of Alcohol announced a grant of \$150,000 to the New York Hospital-Cornell Medical Center to finance a five year research project to get at the roots of the causes of alcoholism. This program is being undertaken as a pilot study to determine the most promising avenues to pursue in the fight against alcoholism. The research will be under the direction of Oskar Diethelm, M.D., Psychiatrist-in-Chief of New York Hospital. Patients will be hospitalized in special quarters. The Cornell project is one of several which the Research Council plans to establish in leading medical schools and their affiliated hospitals.

Other developments in the field of

alcoholism control are a recent announcement by the National Committee for Education on Alcoholism that there are now 19 local citizen committees in 11 states and Washington, D. C., to educate the public in understanding alcoholism as a public health problem. The most recent committee to be formed is in Rochester, N. Y.

In its recent annual meeting the National Jail Association, in resolutions, called upon the U. S. Public Health Service to earmark funds for the establishment of hospitals for the alcoholic and for state and local community programs for the control of this problem, and upon the Veterans' Administration to establish alcoholic wards in the general hospitals of the Administration.

In February the Columbia Broadcasting Company completed a weekly series of 13 coast-to-coast radio programs on "You and Alcohol" initiated because of what it conceived to be the growing importance of public interest in the medical aspects of alcoholism.

As to official activities, six states now have commissions for study of the problem of alcoholism. In Connecticut the work has progressed to the extent of setting up clinics for the treatment of sufferers in the city of Hartford. Six other states have legislative or other proposals which, if realized, will result in commission or other study in these states.

(For earlier discussion of alcoholism as a public health problem see Vol. 36 of the *Journal*, pp. 79, 545, and 925.)

#### CLINICAL FELLOWSHIPS OF AMERICAN COLLEGE OF PHYSICIANS

Following the end of the late war, the American College of Physicians resumed its research fellowships for the benefit of physicians in the early stages of preparation for a teaching and research career in internal medicine. In 1946 also some fellowships for medical officers discharged from service were

provided. The fellowships are designed to provide an opportunity for research training either in the basic medical sciences or in their application to clinical investigation. The stipend ordinarily is from \$1,800 to \$3,000, depending upon individual circumstances.

The first of the 1947-1948 fellowships has been awarded to Thomas F. Paine Jr., M.D., for continuing studies of infectious diseases, with special reference to chemotherapy and the use of antibiotics. His work will be done at the Thorndike Memorial Laboratory of Boston City Hospital. Dr. Paine was awarded a similar fellowship in 1946-1947.

Further information about the fellowships may be secured from the American College of Physicians, 4200 Pine Street, Philadelphia 4.

#### HOMER FOLKS RETIRES

The retirement of Mr. Homer Folks, Secretary of the State Charities Aid Association, New York City, was announced on the occasion of his 80th birthday, February 18, after a service of 54 years with the Association. As the dean of workers in the field of social welfare, Mr. Folks and his organization have been a part of every public health movement in New York State during the last half century, particularly in the organization of citizens' voluntary groups supporting tuberculosis efforts through the State Committee on Tuberculosis and Public Health, which in more recent years has included promotional services in the field of social hygiene, diphtheria prevention, and the organization of local health units.

Mr. Folks was Secretary of a special public health commission appointed in 1913 by the Governor of New York State which successfully urged the passage of a new public health law, important features of which have since been enacted in substance by a number

of other states. The law established the State Public Health Council and Mr. Folks has been a member and Vice-Chairman of the Council since its creation. In 1930 another special public health commission was appointed by the Governor, of which Mr. Folks was also a member. As a result of these studies a plan of state and district tuberculosis hospitals was adopted, and one of the hospitals was named for Mr. Folks at Oneonta.

Not only in public health, but in the field of mental hygiene, child welfare, and public welfare, Mr. Folks has been known in New York State and throughout the country. During World War I he organized and directed the Department of Civil Affairs of the American Red Cross Commission to France and served in Italy, Greece, Serbia, and Belgium during this period. Mr. Folks joined the American Public Health Association in 1912 and has been a Charter Fellow since 1922.

On March 1 Roland Burnstan, Ph.D., assumed his duties as Mr. Folks's successor. Economist, educator, and executive, he has most recently been president of the Lawrence Aeronautical Corporation and has served in the Minnesota State Planning Board and as a member of the League of Nations Committee to study the organization of peace.

## PERSONALS

### Central States

#### CHANGES IN HEALTH PERSONNEL IN KANSAS:

VIOLET KINSTLE, R.N., formerly Chief Orthopedic Nursing Consultant with the Kansas Crippled Children's Commission, Wichita, has accepted a position as coordinator to assist in the development of a new program in Muskingum County, Ohio. The plans for this new project include

physical therapy for crippled children in the public schools of Zanesville and a county-wide program for the care of the handicapped with special emphasis on cerebral palsy, parent education, and counseling.

HENRIETTA HANNA,† generalized Consultant Nurse with the Kansas State Board of Health for the last six years, has accepted a position as Nursing Consultant for the Division of Venereal Disease of the Illinois State Department of Health.

HAZEL ROSS-CRAWLEY, R.N., Field Nurse in the Division of Tuberculosis Control, Kansas State Board of Health, has resigned.

EVA BOURNE, R.N.,† who has been with the Douglas County Health Department since its organization in 1942, has been employed as Field Nurse in the Division of Tuberculosis Control of the Kansas State Board of Health.

ROBERT M. HEILMAN, M.D.,† resigned his position as Director of the Division of Industrial Hygiene, Kansas State Board of Health, and left the department February 1, to work in internal medicine on the staff of Winter Veterans Hospital. Dr. Heilman organized the Industrial Hygiene Division of the State Health Department in 1942.

DONALD HERNANDEZ † was recently appointed Assistant Sanitary Engineer by the DuPage County (Illinois) Health Department, Villa Park, Ill. Before attending the University of Michigan, Mr. Hernandez was employed for 8 months by T.W.A. on a malaria control project in Iran.

ROBERT S. INGOLS, PH.D.,\* has been appointed to the faculty of the Georgia School of Technology, with the rank of Research Associate Professor of Sanitary Chemistry. Dr.

Ingols will work with Associate Professor GEORGE W. REID (Sanitary Engineering) on the recently announced \$20,000 program on water and sewage analysis, jointly sponsored by the U. S. Public Health Service and the School. He will also teach courses in sanitary chemistry as part of the training program for sanitary engineers. Dr. Ingols has most recently been instructor in public health engineering in the University of Michigan.

MARGARET C. LINDQUIST, R.N., has been appointed training assistant in Home Nursing, by the American Red Cross and is serving on the national nursing staff. Before joining the staff at American Red Cross, Miss Lindquist served as advisory nurse for the Minnesota State Department of Health.

ISABELLE MORGAN, M.D., will assume the duties of the Director of the Division of Maternal and Child Health, State Department of Health, Charleston, W. Va., beginning with February 1. For the past two years Dr. Morgan has been on the staff of the School of Public Health, University of Michigan, Ann Arbor.

LEONARD M. PRATT,† formerly Sanitary Engineer in District 3 Health Department in Michigan, and lately returned from a tour of duty with the Army Air Forces in the Philippines, is now Chief Sanitary Engineer with the DuPage County (Illinois) Health Department, Villa Park, Ill.

PHILIP G. RETTIG† has been appointed Director of Research and Legislative Services for the National Society of Crippled Children and Adults, with offices in Chicago. Mr. Rettig was a practising attorney of Chicago previous to his three years of war service as chief of the engineer intelligence branch on General Omar N. Bradley's 12th Army group staff.

### Eastern States

THOMAS R. CAMP,\* consulting engineer of Boston, announces the formation of a partnership with HERMAN G. DRESSER and JACK E. MCKEE to continue consulting practice under the firm name of Camp, Dresser, and McKee. The firm will specialize in water and sewage works and the treatment and disposal of municipal and industrial wastes. Mr. Camp was Professor of Sanitary Engineering at Massachusetts Institute of Technology for 15 years.

CHARLES M. CARPENTER, M.D.,\* of the University of Rochester, N. Y., School of Medicine and Dentistry, has been granted a two months' leave of absence to direct a commission to survey certain aspects of the venereal disease problem in the Pacific Theatre for the Surgeon General of the Army.

WARD H. COOK, M.D.,\* has been appointed to direct the laboratories at the Long Island College Hospital, Brooklyn, N. Y., when the expansion program of the hospital, now under way, has been completed. Dr. Cook has been Director of Bureau of Laboratories, Yonkers, New York, City, for the past 17 years.

WILLIAM A. DOPPLER, PH.D.,\* has been appointed Executive Secretary of the New Jersey Tuberculosis League, Inc. He assumed his duties on April 1. Dr. Doppler has been a staff member of the National Tuberculosis Association, New York, N. Y., since 1935, first as Field Consultant in Health Education, later as Director of Industrial Relations.

L. WHITTINGTON GORHAM, M.D., Albany, N. Y., has been designated by Governor Dewey as Chairman of the State Public Health Council succeeding the late SIMON FLEXNER, M.D. Dr. Gorham is Physician-in-

\* Fellow, A.P.H.A.

† Member, A.P.H.A.

Chief of the Albany Hospital, a member of the executive committee of the S.C.A.A. State Committee on Tuberculosis and Public Health, and of the Health Education Committee of the Albany Tuberculosis Association.

GERTRUDE HESS, R.N.,<sup>†</sup> formerly with the Henry Street Visiting Nurses Association, New York, N. Y., has been appointed by the DuPage County (Illinois) Board of Health, Villa Park, Ill., as Director of Nursing and Health Education for the DuPage County Health Department.

ROSCOE P. KANDLE, M.D.,\* Director, Bureau of Preventable Diseases, New Jersey State Department of Health, has succeeded CECIL K. BLANCHARD on the State Board of Examiners of health officers and sanitary inspectors. Mr. Blanchard retired on January 31, 1947, from his position as Supervisor of District Health Officers and Sanitation after 34 years in the department. With his retirement will be discontinued also "Mark Time," his column in *Public Health News* of the New Jersey State Department of Health.

JOHN N. McDONNELL, M.D.,<sup>†</sup> has been appointed vice-president of the Schering Corporation, Bloomfield, N. J. Through the war years, Dr. McDonnell headed the drug research and civilian penicillin distribution units of the War Production Board.

ROBERT E. PLUNKETT, M.D.,<sup>†</sup> formerly General Superintendent of New York State Tuberculosis Hospitals, has assumed his new duties as Assistant Commissioner for Tuberculosis Control of the State Health Department. As such he will be largely responsible for the fulfillment of the state's expanded tuberculosis control program, the main objective of which is to blot out tuberculosis in New York by 1965.

MARY E. SPENCER, Ph.D.,\* has been appointed chief of the Bureau of

Health Information of the Massachusetts Department of Public Health. Dr. Spencer is known for her work as Director of the Health Education Bureau of the National Welfare Conference in Washington, D. C., representing the United States at the World Federation of Education Association at Geneva. She also served on the Hoover White House Conference on Child Health and Protection. She is vice president of the Massachusetts Public Health Association and Life Member of the A.P.H.A.

HERMAN WEISKOTTEN, M.D.,\* Dean of the Syracuse University School of Medicine since 1925, has been elected chairman of the Council on Medical Education and Hospitals of the American Medical Association. Dr. Weiskotten is the author of *Medical Care of the Discharged Hospital Patient* and of *Medical Education in the United States, 1934-1939*, the findings of a survey of the medical schools of the country.

#### Southern States

N. G. ANGSTADT, M.D.,<sup>†</sup> Director of the Bureau of County Health Work, State Department of Health, Charleston, W. Va., resigned, effective January 1. Dr. Angstadt has accepted the position of Medical Director for the Public School System of Reading, Pa.

BURTON F. AUSTIN, M.D.,<sup>†</sup> after 26 years of public health work in Alabama and serving as head of the State Health Department since 1942, has resigned to take up new duties as Southeastern Regional Medical Director of the American Red Cross with headquarters in Atlanta, Ga.

BERTRAM M. BERNHEIM, M.D., Associate Professor of Surgery at the Johns Hopkins Medical School, Baltimore, Md., has received the third annual Norton Award of \$3,500 for his book *A Surgeon's Domain*. The

award is made annually by the Norton Publishing Company for the best book by a professional man written for laymen.

MAYHEW DERRYBERRY, PH.D.,\* Chief of the U. S. Public Health Service's office of Health Education, Washington, D. C., has been assigned temporarily to serve as Consultant in Health Education with the American National Red Cross. Dr. Derryberry, at the request of the Red Cross, will study its present health education services for the purpose of evaluating and coördinating programs now in operation. He will also advise with G. FOARD MCGINNESS, M.D.,\* Red Cross vice chairman for Health Services, on possible future health education activities of the national organization.

JAMES M. FREEZE, M.D., has been appointed Director of the Alabama State Health Department's Division of Tuberculosis Control. He succeeds N. H. DEJANNEY, M.D., resigned.

J. ROY HEDGE, M.D., recently resigned as District Director of Local Health Service in the North Carolina State Health Department to become Health Officer of Cabarrus County, with headquarters in Concord, N. C.

ELLA MAE HOTT, R.N.,\* has joined the American National Red Cross Nursing staff as Assistant Director of home nursing. Before going with the Red Cross, Miss Hott was director of the Division of Public Health Nursing for the Missouri State Board of Health.

J. D. STILLWELL, M.D., from the regional office in Waycross, Ga., has been transferred to the State Health Department in Atlanta, as Assistant Director of Local Health Organizations. He replaces H. M. GRANING, M.D.,\* assigned to Georgia by the U. S. Public Health Service, and recently recalled by the Service for assignment to Cancer Control Activities.

## Western States

### CHANGES IN CALIFORNIA STATE DEPARTMENT OF HEALTH:

GEORGE T. PALMER, DR.P.H.,\* has been appointed Consultant in Public Health Administration, Division of Administration. Dr. Palmer has served with the Detroit and New York City Health Departments and with the American Public Health Association. He comes to the department following an assignment with the U. S. Public Health Service.

J. WALTER HOUGH, M.D., has been appointed Medical Officer, Bureau of Adult Health. Dr. Hough is on loan from the U. S. Public Health Service. Before joining the department he served with the Oklahoma Health Department.

MARION JOSEPHI, M.D., has been appointed Consultant in Rheumatic Fever, Bureau of Maternal and Child Health.

JOSEPH A. MOORE, M.D.,† has been appointed Acting Chief, Acute Communicable Disease Service.

YOSHIYE TOGASAKI, M.D., has been appointed Medical Officer, Bureau of Maternal and Child Health.

EVELYN SPRAGUE has been appointed Industrial Nursing Consultant, Bureau of Public Health Nursing.

J. M. BURNETT, M.D., assumes the duties of Kittitas County Health Officer, Washington, on March 3, 1947.

S. J. HATHAWAY, M.D., has been appointed Acting Health Officer of Yakima County-City Health District, Washington, during the absence of STANLEY BENNER, M.D.,\* Yakima County-City Health Officer.

EDWARD GAGE TITUS, Sc.D., was appointed Director of the Division of Vital Statistics of the Utah State Department of Health in December,

\* Fellow, A.P.H.A.

† Member, A.P.H.A.



1946, after serving as statistician in the department since February, 1943.

### Foreign

F. KENNETH ALBRECHT, M.D.,† has joined the Editorial Department of the Williams & Wilkins Company, medical publishers of Baltimore, Md. Dr. Albrecht has been associated with the U. S. Public Health Service with the rank of Surgeon.

### Death

INA M. GASKILL, R.N., died in Indianapolis, Ind., January 13, 1947, following a long illness. In 1919 Miss Gaskill was employed by the American National Red Cross to develop rural public health nursing services throughout Indiana. Working with the State Department of Health, she demonstrated the need for a bureau of public health nursing and became its first director in 1921.

### CONFERENCES AND DATES

- American Dental Association—Annual Meeting. Boston, Mass. August 4-8.  
 American Dietetic Association. Philadelphia, Pa. October 13-17.  
 American Hospital Association. Annual Convention. St. Louis, Mo. September 22-25.  
 American Public Health Association—75th Annual Meeting. Atlantic City, N. J. October 6 to 10.  
 American Water Works Association:  
   Annual Convention. San Francisco, Calif. Week of July 21-25.  
   Canadian Section. Mt. Royal Hotel, Montreal, Que. April 14-16.  
   Four States Section. Washington, D. C. November 19-21.  
   Illinois Section. Congress Hotel, Chicago, Ill. April 17-18.  
   Indiana Section. Antlers Hotel, Indianapolis, Ind. May 7-9.  
   Iowa Section. Cedar Rapids, Iowa. October 9-11.  
   Kentucky-Tennessee Section. Louisville, Ky. September 22-24.  
   Michigan Section. Bay City, Mich. September 18-20.  
   Montana Section. Havre, Mont. April 25-26.  
   Nebraska Section Organization Meeting. Cornhusker Hotel, Lincoln, Neb. April 11-12.  
   New Jersey Section. Atlantic City, N. J. November 6-8.  
   New Jersey Section. Outing. June 19.  
   New York Section. Hotel Statler, Buffalo, N. Y. April 10-11.  
   Ohio Section. Columbus, Ohio. September 30-October 1.  
   Pacific Northwest Section. Victoria, B. C. May 15-17.  
   Southeastern Section. Atlanta, Ga. November 3-5.  
   Southwest Section. Amarillo, Tex. October 13-15.  
   Virginia Section. Roanoke, Va. November 17-18.  
 Federation of Sewage Works Associations. San Francisco, Calif. July 22-24.  
 Georgia Water and Sewage Association. Georgia School of Technology. Atlanta, Ga. September 17-19.  
 Indiana State Medical Association. 98th Annual Session. Lick Springs Hotel, French Lick, Ind. October 28-30.  
 Industrial Health Meetings:  
   American Association of Industrial Dentists. Hotel Statler, Buffalo, N. Y. April 30-May 1.  
   American Association of Industrial Nurses. Hotel Statler, Buffalo, N. Y. April 30-May 4.  
   American Association of Industrial Physicians and Surgeons. Hotel Statler, Buffalo, N. Y. April 29-May 1.  
   American Conference Governmental Industrial Hygienists. Hotel Statler, Buffalo, N. Y. April 26-29.  
   American Industrial Hygiene Association. Hotel Statler, Buffalo, N. Y. April 29-May 1.  
 Interstate Post Graduate Medical Association of North Carolina. Public Auditorium, St. Louis, Mo. October 13-17.  
 New England Health Institute. University of New Hampshire, Durham, New Hampshire. June 16-18.  
 New York State Association of Health Officers and Public Health Nurses. Annual Conference. Grand Union Hotel, Saratoga Springs, N. Y. July 28-31.  
 New York State Association of Milk Sanitarians. Annual Meeting. Hotel Hamilton, Utica, N. Y. September 18-20.  
 Society of American Bacteriologists. Annual Meeting. Bellevue-Stratford Hotel. Philadelphia, Pa. May 12-16.  
 Third American Congress on Obstetrics and Gynecology. Municipal Auditorium. St. Louis, Mo. September 8-12.

# American Journal of Public Health

## *and* THE NATION'S HEALTH

---

Volume 37

May, 1947

### Maternity and Child Welfare in a Large British City\*

JEAN M. MACKINTOSH, M.D., D.P.H., D.P.A.

*Senior Assistant Medical Officer for Maternity and Child Welfare,  
Birmingham, England*

BEFORE describing the work of my department I think it would be well if I gave some factual information for the benefit of those who are not very familiar with the British background.

Although Great Britain is no larger in area than a medium sized American state, approximately 45 million people live there. There is no part of the country which does not come within the purview of an organized health department. Each of these departments is under the control of a whole-time medical officer who has had postgraduate training in public health. For all practical purposes there are only two levels of government—central and local—as opposed to three in the United States.

Except in some of the lower grades all central and local government employees have security of tenure and are pensioned. The contribution made by voluntary funds to public health services is infinitesimal compared with the United

States. All the activities of public health departments are paid for out of tax funds, either central or local. The proportion which comes from central funds may vary from 20 to 60 per cent and is based on a complicated formula which takes into account the amount of unemployment in the area, the birth rate, and other factors.

I might say here that, although the local authorities receive subsidies from the central exchequer, there is no suggestion that dictation of policy comes from the center. Indeed there are occasions when quite the contrary is the case. I think it would be true to say that no legislation is put up by the central government for consideration by Parliament without prior consultation with the local authorities and, indeed, these local authorities may themselves suggest to the central government legislation which they think desirable. There are occasions when the central government and the local authorities are unable to reach agreement on main principles but these are rare. When this occurs the matter is argued out in Parliament and a compromise is usually reached. Since 1930, the medical officer

---

\* Presented before a Joint Session of the Maternal and Child Health, Public Health Nursing, Dental Health, and School Health Sections of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 13, 1946.

of health for the larger local authorities has had administrative charge of all general and contagious diseases. The new plan for a National Health Service is going to alter this situation in certain ways but that is outside the scope of this discussion. Local authority health services are available to all citizens regardless of income. In certain instances there is recovery of cost, or a proportion of the cost, according to the ability to pay.

Birmingham is a city of a million inhabitants and is the center of a great industrial area. The city occupies 51,147 acres. It is surrounded, especially to the north and west, by densely populated areas. Situated in a rich coal and iron region, it has increased greatly in importance and size during the last 100 years. This rapid expansion took place in the early years without any organized planning, and has left the city a legacy of bad housing, cramped streets, and overcrowding. Before the outbreak of war 50,000 houses were being considered for demolition. During the war 14,219 dwellings were totally destroyed by enemy action and 111,245 others were damaged. Before the war there were approximately 300,000 dwellings in Birmingham; 55,000 houses were owned and rented to citizens by the City Council. During the past year 1,356 houses have been erected, 232 by private enterprise and 1,124 by the City Council. In a similar period after the first World War only 826 houses were erected compared with 1,356 on this occasion. Birmingham is a city of a thousand trades in contrast to many other cities in Great Britain which are wedded to one type of industry. As a result Birmingham has an economic resilience which many cities lack and, in consequence, did not suffer the worst effects of unemployment during the years between the two wars.

The Maternity and Child Welfare branch of the Health Department is

primarily concerned with the care of the expectant and nursing mother and of the child up to the age of 5 years who is not in attendance at a nursery school. The care of children in the nursery schools and the public schools is the responsibility of the School Medical Department which, in Birmingham, is a separate department from that of the Medical Officer of Health. This arrangement is exceptional. In most parts of Great Britain the Medical Officer of Health is also in charge of the School Medical Department.<sup>1</sup>

My staff consists of 20 whole-time medical officers, 35 part-time medical officers, 118 whole-time, fully qualified public health nurses, 130 nurse midwives who deliver women in their own homes, and the medical and nursing staffs of four maternity units and a babies' hospital for children under the age of 5 years. We have 32 child health centers or stations. In addition we have 6 residential nurseries and 50 day nurseries providing accommodation for 2,500 children under 5 years of age. During the war we had 75 day care nurseries caring for 3,500 children. These nurseries are for children whose mothers go out to work, are ill, or for some other reason are unable to give the children adequate care. The total number of staff attached to these nurseries at the present time is 730.

The annual expenditure out of public funds on public health in Birmingham including expenditure for hospitals and tuberculosis, is approximately 6 million dollars. One-third of this amount is spent on maternity and child welfare services. This includes some expenditure for hospitals. If hospital expenditure is excluded, the annual cost to public funds of providing a domiciliary midwifery service is \$160,000, and of the other activities of my department \$1,200,000. The cost of the school medical service is \$290,000. The school lunch service costs the city \$951,000.

To put it another way—the total expenditure of the Public Health Department, including expenditure on hospitals and tuberculosis, is approximately \$6 a person. (This does not include the cost of the school medical service.) This breaks down into a little more than \$4 a person for all hospital services, including tuberculosis and maternity care, and something less than 20 cents a person for the domiciliary midwife service. The cost of the maternity and child welfare service, exclusive of the hospital and midwife services mentioned above but including the cost of child health stations, added to the cost of the school medical service, comes to about \$1.50 per person.

In describing the work of the department I would like to begin with the pregnant woman who wishes to make arrangements for her confinement. She has three courses open to her:

1. She may engage a private doctor to attend her either in her own home or in a nursing home. If she decides to have the doctor attend her in her own home, she can engage either a private nurse midwife or one of the nurse midwives employed by the department who, in this case, would act as a maternity nurse and work under the direction of the private doctor. (Approximately 50 per cent of the women confined in Birmingham are delivered in their own homes. Only 20 per cent of these have a doctor in attendance.)

2. She may engage only a city nurse midwife and have her baby in her own home. In this event, the nurse midwife is responsible for the patient and a doctor is called only when necessary. In only 5 per cent of the cases where a nurse midwife is responsible for the confinement did she consider it necessary to call a doctor to assist her at the confinement.

3. She may elect to be confined in one of the hospitals in the city. Owing to the great shortage of maternity beds at the present time, this may not be possible. Admission to hospitals has to be strictly limited and certain cases must be granted priority. Maternity hospitals are staffed throughout with nurse midwives or nurse midwives in training.

In either of the last two cases the

mother will attend a prenatal clinic either at the hospital or at one of the Maternity and Child Welfare Centers in the city. The clinic is staffed by a doctor, public health nurses, and nurse midwives. The doctor is either a whole-time or a part-time employee of the City Council, and has special qualifications for this work.

If the patient's home is far from the hospital of her choice at which arrangements have been made for her admission, she attends a prenatal clinic at the nearest Child Welfare Center until the 28th week of pregnancy, when she is sent to the hospital clinic with a cooperation form giving full particulars of her progress. This gives the doctor who is to be responsible for her delivery an opportunity of examining her. Thereafter, unless there is some special abnormality, she continues to attend the Child Welfare Center clinic until the 36th week, when she returns to the care of the hospital clinic.

If the mother intends to have her baby at home and has engaged a city nurse midwife she continues to attend the district prenatal clinic, her nurse midwife being present at each examination.

During the war, owing to the difficulties of transportation, shortage of staff, black-out conditions, etc., the nurse midwives were unable to give adequate prenatal care to their own patients and more and more of the examinations, which the midwives are quite capable of performing, had to be made by the doctors at the clinics. It is not considered desirable that this practice should continue. In consequence, now that the war has ended and the shortage of staff is slowly abating we propose to make some new arrangements whereby the nurse midwives will hold their own prenatal clinics at Child Welfare Centers and refer cases from there to the doctors' clinics. We also have an emergency service for domiciliary midwifery cases

which makes the services of a consultant and a blood transfusion outfit immediately available in the patient's own home on the call of the doctor. Except where the patient has made her own private arrangements, payment for these domiciliary services is made by the city to the doctors concerned. Thereafter recovery of expense is made from the patient according to her means.

You will see from this account of our midwifery services that the nurse midwife occupies a much more important place in Great Britain than she does in either the United States or Canada. With us she is an independent practitioner. The great majority of nurse midwives in Great Britain are fully trained state-registered nurses who take midwife training after completing their general training. A state-registered nurse who wishes to become a fully qualified midwife must take a year's additional training. Other women who wish to become fully qualified midwives, and who do not have the training of a state-registered nurse, must train for a period of 2 years. The majority of these nurse midwives are in salaried appointments. In Birmingham, for example, only 10 per cent of the nurse midwives in domiciliary practice are in independent practice.

Apropos of this, it is interesting to note that our figures in Birmingham for maternal deaths, stillbirths, and neonatal deaths are as good as any similar figures obtained for cities in this country. In the present state of our knowledge it is believed that 39 per cent of these maternal deaths were avoidable. I wish I could say that our record for infant deaths between 1 month and 1 year were as good. In that age period we are far behind what has been attained in the United States. Our lowest infant death rate in Birmingham was 42 in 1944, of which approximately half occurred after the first month of life.

It is not enough to make arrangements for the mother. The family too may need assistance during the period of the confinement. Here too we come to their aid. If the expectant mother is to be confined in a hospital, and if she is unable to make private arrangements for her family, the other children may be admitted to a residential nursery operated by the department for the period of her stay in hospital.

Whether the mother is confined at home or in a hospital she may be in need of domestic assistance in her own home. This the Maternity and Child Welfare Department supplies through its Home Help Service, or as you would call it—the Homemaker Service. The Home Helps are usually middle-aged women, married or single, who have an aptitude and liking for domestic work and children. They receive a short training, which includes some instruction in cooking and housework and the feeding and care of children. When not engaged on a case they are paid a retaining fee of 50 per cent of their normal wage. The vast majority are daily workers who go into the home from 8 a.m. to 4:30 p.m. each weekday. Recently we have begun the experiment of residential Home Helps. During the war this service fell to a very low ebb but recruitment is now going on steadily. When I left we had a staff of 110 of these women but we could do with many more.

Notification of all live and stillbirths are sent to the Medical Officer of Health by the nurse midwife or doctor within 36 hours of delivery. The midwife continues to attend the mother for a fortnight either at home or in the hospital. As soon as possible thereafter the mother is visited in her own home by a public health nurse. The public health nurse in Great Britain is a fully trained state-registered nurse who has had in addition 6 months' training in midwifery and 6 months' training in public health

nursing, each period of training being followed by an examination. The great majority of public health nurses do educational and preventive work only and do not engage in bedside care. In scattered country areas however, they may combine their public health work with bedside care.

The public health nurse gives advice to the mother on the feeding and management of her baby and invites her to attend the child welfare clinic. At her first attendance, the mother, unless she has previously been examined in a hospital, is given her postnatal examination, as well as advice about her baby. The services of the public health nurse are available to every mother in the city. In fact, in Birmingham in 1945 the public health nurse visited 91 per cent of the infants born in that year. Eighty per cent of the children visited in their first year attended the Child Welfare Centers. Half of our 32 Child Welfare Centers are in buildings erected for the purpose; the others are in converted buildings used solely for that purpose.

The mother is encouraged to bring her baby to the Child Welfare Center at regular intervals up to the age of 2 years. After that the child attends a toddlers clinic which is run on the lines of a school medical inspection and receives a full physical examination every 3 months. Attendance at these clinics is by appointment and they are becoming increasingly popular among young mothers. In the interval between these appointments mothers are at liberty to take their children to the ordinary child welfare conference.

Other activities are also carried on at the Child Welfare Centers, such as, diphtheria immunization clinics, ultraviolet light clinics, remedial exercise clinics, sewing classes, cookery classes, etc. At other sessions talks on the various aspects of parent-craft are given to the mothers. Dental care is given to

mothers and children. Dentures are also provided when required for the mothers.

A special feature of the work in Birmingham is the care of the unmarried mother and her child. In 1945, 9.2 per cent of total births were illegitimate. Thirty-three per cent of these infants were born to married women. We have three public health nurses especially assigned to deal with this work. Over 90 per cent of the women in the city who are illegitimately pregnant come to our department for assistance. We arrange accommodation for them before their confinement, either in a home for unmarried mothers or in private lodgings. If the mother is in poor financial circumstances we assist in the payment for these lodgings. We arrange for her delivery and, if need be, we place the mother and baby in lodgings after delivery to give them an opportunity to get on their feet. Thereafter we give special care to the baby until it is 1 year old. As a result of this, twice during the past 5 years the infant death rate for the illegitimate child has been lower than the infant death rate for the legitimate child.

We also exercise supervision over children up to the age of 9 years who are boarded in private homes by their parents or relatives. We have a program whereby the foster mothers are subsidized by our department. We found that the type of woman engaged in this work was not very good, because of the precarious financial return. The unmarried mother could not always be relied on to pay her way. Under our program the foster mother is paid directly by the department and the mother of the child is asked to pay to the department what she can afford toward the child's maintenance. We find that the mothers respond well to this arrangement and that they repay as much as they can afford. When the program was started in March, 1935, the net weekly cost per child to the

city was \$1.10. In 1945, the net weekly cost per child was 23 cents. During the war years the economic circumstances of these women improved and in consequence they were better able to meet their responsibilities. We also deal with 71 per cent of the children who are placed for adoption in the city, arranging full medical examination for them and their adopting parents.

It is not possible here to deal fully with the many other aspects of the work undertaken by my department. I can only mention in passing our training school for public health nurses, which we run in collaboration with the university, and which takes 50 students each year; the work which the health visitors undertake as part of the general health education program in the schools, the youth clubs and adult organizations; our supervision and operation of day and residential nurseries, and our supervision of private nursing homes and nurse hiring agencies.

Lastly, I must say a word about the Child Health Institute. For a long time we in Great Britain have felt that there has been too great a gulf between the curative and the preventive sides of pediatrics. In consequence a number of Child Health Institutes have been set up throughout Great Britain in association with the universities. The type of organization varies from place to place. In Birmingham we hope we are going to be able to achieve the perfect marriage between curative and preventive pediatrics.

The Child Health Institute in Birmingham is as yet merely an organization and not a concrete building. Whether its activities will ultimately be housed in one building remains to be seen. At the present time they are carried on at the Children's Hospital and one of the larger welfare centers. The Institute is managed by a Council which consists of the following members:

The Vice Chancellor of the University  
The Professor of Child Health  
A member of the Medical Board of the Children's Hospital  
Two lay members of the Board of the Voluntary Children's Hospital  
The Professor of Social Medicine  
The Professor of Obstetrics and Gynecology  
The Medical Officer of Health  
The Senior Medical Officer for Maternity and Child Welfare  
The School Medical Officer  
The Tuberculosis Medical Officer  
Two members of the Public Health Committee of the City Council  
Two members of the Education Committee of the City Council  
A member of the British Medical Association

It is staffed by:

1. *A whole-time Professor of Child Health* who is allowed to carry a limited amount of private practice. He is appointed and paid by the university, and the conditions of his appointment and the amount of his remuneration are settled by the university. By virtue of his position as Professor of Child Health he is a physician on the staff of the Children's Hospital and as part of his duties is available when required to act as a consultant in the child welfare service.

2. *Readers*—These are two in number and of equal standing. One gives part-time service and is a local authority medical officer who supervises the training of undergraduates and postgraduates in the preventive aspects of child health. At the moment I act in this capacity. The other Reader is a physician in the whole-time employ of the university and is paid by them. He is also on the staff of the Children's Hospital. The rate of his remuneration is fixed by the university. He acts as assistant to the Professor in all branches of the work except the organization of that part of the teaching which deals with the preventive aspects of child health.

3. *Lecturer in Child Health*—This is a part-time appointment. The lecturer is a member of the local authority staff

who, under the direction of the Reader, gives lectures on various aspects of child welfare to undergraduates and post-graduates. In addition, she acts as medical officer to out-patients  $\frac{1}{2}$  day a week at the Children's Hospital and has opportunities to follow up the cases seen there in the wards. For this reason she is designated as a clinical assistant.

4. *Physicians*—These physicians are 4 in number. They are on the staff of the Children's Hospital and engage in private practice. They will also be available for consultation in the child welfare service.

5. *Clinical Assistants*—In addition to the lecturer in child welfare, certain whole-time medical officers of the local authority attend  $\frac{1}{2}$  day a week at the out-patient department of the Children's Hospital. In addition, they spend  $\frac{1}{2}$  day a week in the wards of the Children's Hospital.

6. *Registrars*—These officers are 4 in number and are on the staff of and paid by the Children's Hospital. They each act as medical officer at two child welfare conferences a week, in the local authority service as part of their normal duty and without additional remuneration.

The plan is financed by the university, the City Council, and the Children's Hospital. These three bodies bear the cost equally between them. It is estimated that the annual operating costs will be in the neighborhood of \$60,000. The Institute aims to improve and extend the knowledge of undergraduates and postgraduates in all aspects of preventive and curative pediatrics and to promote research as well as to raise the level of child care in the area.

In conclusion I have been asked to say a few words about what I think the impact of the new National Health Service on the present maternity and child welfare service is likely to be. The first thing that will happen is that

the maternity hospitals will cease to be the immediate concern of the public health department. It is not intended, however, that there shall be a sharp division between hospital and domiciliary midwifery practice, but rather that there shall be coördination and correlation between the two.

It has been said that the family doctor will take over the work of maternity and child welfare departments. If this happens at all, which I very much doubt, I think it will take at least ten years to bring it about. The term "family doctor" is an example of the modern tendency to use a word or phrase sometimes as an anesthetic, sometimes as a bogey man. It is nowhere suggested in the National Health Service that a wife must of necessity have the same doctor as her husband. Indeed it has been said that when group practice is set up in health centers certain practitioners will specialize, for example, in pediatrics. Either situation is incompatible with the term "family doctor." The type of educational work being undertaken by medical practitioners at child health stations has not so far been taught in any great degree to undergraduates, although a beginning has been made. Neither are our pediatricians, in Britain at least, as yet fully cognizant of the preventive aspects of their work. For these reasons I think the discontinuance of our work during the next few years is, to say the least, unlikely. It may gradually evolve into something else, but that is another matter.

The National Health Service Act also requires local authorities to organize a nursing service for bedside care. This immediately brings up the question of what should be the extent of a generalized nursing service. Opinions are sharply divided about the matter in Great Britain, at the moment, and I cannot venture to predict what the outcome will be. All I can say is that as



far as the Maternal and Child Health Services as a whole are concerned, I feel that far from diminishing in importance they are likely in the future to

make an increasing contribution to the welfare of the nation as a whole.

#### REFERENCE

1. Underwood, J. E. School Health Service in England and Wales. *A.J.P.H.*, 36, 7:703 (July), 1946.

---

## British Representation at the 75th Annual Meeting

Great Britain will be well represented at the 75th Annual Meeting of the Association in Atlantic City. Both Sir Andrew Davidson, Medical Officer of Health of Scotland, and Sir Allen Daley, County Medical Officer of Health of the London County Council, have been invited to speak before the Health Officers Section. In connection with his visit to the United States, Dr. Daley will visit a number of cities and schools of public health to study the administrative procedures that result in low infant mortality and tuberculosis death rates and to study American methods of training public health officers.

The Royal Sanitary Institute will

send two official representatives to the meeting: F. T. H. Wood, O.B.E., M.D., O.P.H., who is chairman of the Council of the Royal Sanitary Institute and Medical Officer of Health of Bootle, Lancashire; and Charles Porter, M.D., M.R.C.P. (Edin.), who is past chairman of the Council and vice president of the Institute and a retired Medical Officer of Health.

Also planning to attend the Atlantic City meeting is Dr. R. Sutherland, Medical Secretary of the Central Council for Health Education and editor of the quarterly, *Health Education Journal*. He will visit a number of health education activities in the United States.

# Regulation of Housing: Hints for Health Officers\*

CHARLES S. ASCHER, LL.B.

*Formerly Regional Housing Expediter, Office of the Housing Expediter,  
New York, N. Y.*

I SHOULD like first to come to an agreement with the health officer about the use of certain legal phrases which I am certain have often befuddled him in his dealings with the city attorney or in his appearances in court. I should like to put into their legal setting the ideas that this paper is to discuss.

The regulation of housing is an application of the police power, the power of the community to insist that an individual limit his freedom of action in the paramount interest of the community, without compensation. Fortunately, under our Anglo-American system of law the courts have steadfastly refused to stake out the boundaries of that power. In the classic words of Justice Holmes, it is defined by the pin-pricks of conflicting decisions—a process admittedly not intellectually satisfying to a scientifically trained mind, but one that has certain advantages in the resolution of conflicts between individual liberty and social controls.

Holmes, in another decision, outraged even the lawyers who like to rest intellectually in neatly defined and rigid categories by saying that the police power was whatever the community preponderantly desired at a given time. Without being a lawyer, the health officer must have observed within the

span of his own professional career that he can today obtain public and judicial backing for controls that he could not have dreamed of exercising several decades ago. One of the topics I should like to discuss is the reason for this progressive change as a lawyer and administrator would analyze it.

There is another power of the state, the power of eminent domain, sometimes called condemnation. (This must be distinguished from "condemnation" as the health officer uses it in speaking of the enforced destruction of decayed meat. That, it will readily be seen, is an exercise of the police power.) The power of eminent domain is the power to take a man's property or limit his use of it in the paramount interest of the community with just compensation. The line is shadowy between those acts of control for which a legislature and a court will say that the community should pay and those upon which it may insist without compensation. Not only is the line shadowy, it moves.

The early history of the control of the height of buildings is an account of the attempt to buy from property owners the right to build above the socially desired height. After a few tries in which the legality of the use of eminent domain for this purpose was upheld by the courts, people got restive. The approach seemed rather like the economy of the famous village of Ballycannon where everyone made a living taking in everyone else's wash. So the public said simply, "We will forbid—"

---

\* A paper read at a training course in housing for health officers sponsored by the School of Public Health, University of Michigan, Ann Arbor, August 27-29, 1946. Printed by permission of the School of Public Health.

and the courts upheld the action. Oddly enough, the economics of land works out so that the value of land quickly adjusts itself to an intensity of use based upon the legally permitted height of buildings.

It is also instructive to note that the friends of this form of control—it is one of the elements of zoning—deliberately avoided bringing a test case to the highest court for nearly ten years. They yielded here, they compromised there. But when the Ambler Realty Company protested the control of its land by the Village of Euclid to the United States Supreme Court, Justice Sutherland, no flaming radical, could uphold the new exercise of the police power in a broad, ringing opinion in which one of the chief arguments was, forsooth, that more than 25,000,000 people were living in 366 zoned municipalities as against fewer than 11,000,000 people in 48 zoned cities and towns five years before. This effective use of statistics was a favorite technique of Justice Louis Brandeis in his arguments before the Supreme Court as a practicing attorney. It was a new approach couched in scientific and sociological terms.

The argument that so large a segment of our population was then living under the beneficent influence of zoning was a cogent one which the United States Supreme Court could not ignore. This approach is a lesson in major strategy that might well be mastered by health officers for use in campaigns in theaters other than zoning and housing.

Centuries ago, long before our Constitution was written and the body of American constitutional law was developed by such free minds as Holmes and Brandeis, courts recognized that an owner's use of his property could be to the detriment of others, particularly neighboring property owners. Indeed, a Latin tag was established as a principle of the medieval law of land: use

your property so as not to injure another. Even a court dedicated to the sanctity of property rights could easily concede that, although your home was your castle, you could not let raw sewage flow over onto the land of an owner down the hill; you could not dig an excavation that would undermine your neighbor's house. Such a court was ready to restrain uses of land that offended the neighbors' senses of smell and hearing: a tannery set up too near homes; a stamping mill that shook the dishes on neighbors' shelves—these were "noisome," they were "nuisances," they could be "abated" at the suit of the outraged neighbor.

Many health officers have a notion that their strength lies in persuading the courts that something against which they want to proceed is a nuisance. I am one of a group of lawyers who are convinced that there is no future to the doctrine of nuisance, for several reasons. First of all, some of the uses of land and buildings that you want to control are not "noisome," they are just in the wrong place. No one could claim that they are illegal *per se*, indeed they may be necessary for the community. But in a well ordered city the public should be able to prescribe the proper location for them. That is not the same as saying that they are offensive or noisome or a nuisance.

Second, the body of legal doctrine on the abatement of nuisances was evolved before the germ theory of disease was accepted. There was, therefore, no special expertness, there were no objective factual data with which a group of persons like health officers could claim special or exclusive competence to deal. Their appearances in court were as purveyors of opinions to be pitted against the opinions of others. There was no valid reason to prevent a court from substituting its judgment for that of an opinion witness in its eagerness to assure the protection of property rights.

Thus, in a 19th century leading case, the highest court of New York was asked to pass upon evidence consisting of "statements of competent persons under oath that the business endangered the health of the people of the vicinity, was offensive to the senses, and rendered their life uncomfortable." (In that case, moreover, the municipal official had first issued the order to abate the nuisance and the property owner had been given a hearing after the official act, not as a basis for deciding whether to take official action.)

The doctrine of nuisance is not a profitable one through which to move forward with housing regulation. To try to bring about a series of judicial redefinitions of nuisance is not a realistic way to bring modern standards of health and housing expertness to bear upon the elimination of substandard dwellings.

I have thus far suggested that neither eminent domain nor the common-law doctrine of nuisance is the basis for the regulation of housing by health officers and housing officials and city planners; we must look to the police power for our base. I have thus led the health officer to the edge of a most fruitful field, from which, however, I find that health officers tend to shy away.

There are in our society many other forms of limitation of the action of the individual in the interest of the community. Scientists other than medical men have worked with lawyers in evolving modes of enforcement that achieve the goals of the scientist while still preserving adequately the rights of the individual. Why should we not look at the tools they have forged, why should we not analyze our problems using the calculus that they have devised, to see how we can restate our purposes in such terms as to take advantage of the progress made in other fields? There seems to be no reason. Yet, I have seen

a group of the ablest health officers completely baffled when I have said that there was something to learn from the U. S. Steamboat Inspection Service, or the Immigration and Naturalization Service: what problems, pray, could they have that had any meaning for healthful housing?

There is a group of men to whom I urge you to turn for help. They are the catalysts, the specialists in evolving modes and procedures that balance community interest and individual rights in ways that gain acceptance in the courts. They are called administrative lawyers. There are not many of them among the larger group of lawyers, or even of municipal lawyers. I am not one of them, but I know them and I have gained respect for the importance of what they have to offer those seeking to advance the service state, to obtain support for the government that seeks to protect its citizens and bring to social living the findings of modern science.

Their formulations seem annoying to the scientifically trained public officer who knows he is right and knows what ought to be done. It does not seem to make sense to throw the enforcement case out of court, when the property owner had actual notice of the alleged violation, merely because the ordinance under which the health officer was acting did not require notice. The owner was in the wrong and he knew perfectly well what was wrong. Nevertheless, I have had to say to friends in the U. S. Public Health Service: "If you want to put people in jail, you'd better listen to my administrative law friends. Do you want to put people in jail or don't you?"

And I have had to assuage the feelings of one of the ablest health officers in the country—a leader in seeing the importance of good housing for health—the health commissioner of a large eastern seaboard city. He tells me of a flagrant violation of healthful housing,

an open sewer backing up in a cellar. He tells of the months lost in the search for the legally responsible person, while one defendant after another wiggles out of his grasp, by asserting that he is only agent or former owner. When the owner is cornered, his attorney obtains continuance after continuance. A year later, the health officer finally confronts the owner in court, having wasted the taxpayers' money in half a dozen unnecessary reinspections. He introduces in evidence the photographs, which reek with a stench that reaches even a judge's nostrils. "Do you mean to say this condition is allowed to exist?" "Well, your Honor," says the inspector, "just last week on the eve of this trial the owner made a half-hearted attempt to correct this condition, so that its worst aspects have been modified." "Then what are you doing here? You got what you wanted, didn't you? Case dismissed," thunders the judge. And I have to persuade the Commissioner of Health that this disposition of the matter is just about the verdict that any jury of twelve average reasonable Americans would bring in. The owner complied, didn't he? Sure, it took him a while and he stalled around. But we won't put him in jail for that.

Rightly seen, enforcement is one of a series of tools of the administrator as agent of society to bring about conformity with socially desired standards. His task is always to balance or blend education, persuasion, coercion. He must recognize honest attempts to conform which are within a range of tolerance. That tolerance point must be explainable to the average citizen, the legislature, and the courts.

The administrative officer must, therefore, first develop from the body of scientific knowledge a set of principles within the scope of public understanding and support. He must then make a particularized set of rules to guide enforcement that will make clear

the standards to be imposed. There must be artistry in taking into account sources of opposition, in adapting proposals to opponents' criticisms before test cases arise to unsettle basic authority and power. (Recall what I said about *Ambler vs. Euclid*.)

Note that I have several times in the last paragraphs emphasized *standards*. Let me elaborate the significance of standards for the objectives we all have in view. Only by developing objective scientific criteria to measure whether a dwelling is substandard have we provided any basis for raising the place of the health officer above that of another purveyor of opinions. And in a contest of opinions, the judge, being human, will deem it entirely proper to substitute his opinion for that of anyone else in the case. He has the last word, hasn't he?

If we can confront the judge with skillfully marshalled classes of data about which he cannot question, even to himself, the competence of the specialist to express that final opinion, we have put him in a position where he can gracefully, and without lowering the dignity of the bench, rely on the evidence of the scientist and upon the will of the people as represented by the acts of their legislative bodies. It is in such cases that we get these beautiful declarations of recognition of limitations of judicial power. "Ours is not the task of saying whether the ordinance is wise: that is the task of the city council. We cannot say that they lacked a foundation for believing the regulation to be necessary. And the defendant has not presented evidence to show that the health officer did not correctly apply the rule in this case in conformity with procedures that gave the defendant an opportunity to be heard before official action was taken against him."

This status of finality of findings of fact in regulations of public health can be attained for administrative action in

the field of housing. This is a necessary step in the emergence of standards of administrative legality. As these standards are increasingly observed in the practical work of the government housing agencies, judicial review will take a more and more constructive turn.

It can be won only as scientists develop objective, scientific criteria. Those criteria may apply to the structure or its structural parts to its relation to its surroundings and its life maintenance and to the neighborhood of which the dwelling is a part even though the building is not structurally falling apart. Collapse is not essential to establish substandard housing. There must be new criteria for what is substandard.

It is to the development of those scientific criteria that the Subcommittee on the Hygiene of Housing of the American Public Health Association has devoted itself for nearly a decade. Other articles in this JOURNAL have reported its notable achievements,<sup>1</sup> about which I can boast because, although a member of the committee, I have had no hand in that part of its work. I can only emphasize that without this scientific basis, we cannot ask the court to accept our *ipse dixit*, our fiat, as final; we cannot ask the court to refrain from balancing our opinions against those of others—and its own.

We have thus far seen that the police power is the basis for housing regulation and that validity will be given the administrative finding and decision of the health officer only if he acts under standards in accordance with recognized procedures. There is a good deal of talk about tightening up the procedures for enforcement. A survey was made by the Comptroller's Office in Detroit in 1945 of the feasibility of combining inspectional forces so that a building would be examined for safety of structure, electrical facilities, plumbing, and other features without duplication of visits. Similar surveys have been made

in Los Angeles County, in Newark, in Hartford. Professor Spencer Parratt of Syracuse University went on a mission last year for the National Housing Agency and the American Public Health Association and failed to find any city in which such joint and combined inspections were taking place. Frankly, he and I came to the conclusion that the cart was being put before the horse in emphasizing joint inspection (or enforcement) and that the first essential for winning court support—that presumption of validity of findings—was joint and combined establishment of regulations. Let me discuss that problem for a moment.

The development of the service state in the first half of the 20th century has seen widespread recognition in every industrialized nation of the fact that a legislature can no longer prescribe details of permitted conduct. Precisely as the setting of standards has involved research and science, the legislature has felt impelled to delegate to administrators detailed specification guided by broad statements of legislative purpose. The courts have acted as moderators in the manner that I have described to balance individual rights against the occasional overeagerness of the administrator and his scientific staff in pursuit of their objectives.

What administrators have sometimes overlooked is the opportunity afforded in the early process of making the regulations to guide, to educate, to indoctrinate, to warn, and to lay a basis for effective enforcement and ready court acceptance of the standards which lead inevitably to the desired result. The enforcement order is more apt to be given the presumptive effect that is the essence of the administrative process when properly invoked if it is based upon a carefully determined body of rules specifying the standards, the violation of which is deemed illegal. Making these rules is more than estab-

lishing a compendium of scientific data, the consensus of tried, scientific study and knowledge. It is a considered process for education, persuasion, and democratic participation. If those who are to be affected are consulted in framing the rule, they will have an understanding which is a first step toward voluntary coöperation and acceptance. The administrator will be able in this way to ascertain how far the community is ready to go with him at this time; where he will have to make his compromises. He will have a golden opportunity to explain to an intensely interested audience why he is doing what he proposes to do.

The germ theory of disease as a basis for public intervention suggests the leading rôle of the health officer in framing these regulations. But structural safety, fire prevention, the avoidance of moral hazards, the promotion of recreation and even esthetics call for the blending of social science and engineering skills. Within the past two years we have had numerous instances of the ready coöperation of health officers, housing officers, and planning officers in the use of the techniques of appraisal developed by our Subcommittee on the Hygiene of Housing. It would be a great contribution if health officers in their home communities would work quietly for the setting up of a committee within the city government on which these officers, the city engineer, and the city attorney were represented, to deal with housing regulation.

There is another reason for a broad approach that I think is important to bring out here. While I have preached objective science as the basis for enforcement, I do not want to leave the false impression that science determines all. Let me bring in boldly the word politics—and let me show that it is not necessarily frightening. Every act of the administrator—if it affects people's lives and property—necessarily

has political implications. Robert Davison, for many years director of research for the Pierce Foundation, gives a vivid illustration of the relation between science and politics in regulation. The traffic engineer will tell you that if the law limits the speed of motor vehicles to 25 miles an hour, there will be almost no traffic deaths. Yet we know that no city council will ever pass an ordinance limiting speeds to 25 miles an hour. Why? Because the councilmen know that Americans prefer *some* risk of death rather than to accept so extreme a limitation on their freedom of motion.

Similarly, a national scientific body may prescribe a test, supervise its execution, and interpret its significance to show that a given material will withstand a wind pressure of 60 miles an hour but not 80 miles an hour. It remains a *political* decision for the council or the administrative rule-makers to insist that the citizens of their town to be put to the extra expense of using materials capable of withstanding 80 mile winds in the light of climate, experience, and guesses as to the future.

Now here is the point I want to make: so long as we have one set of rules or ordinances about plumbing safety, another about structural safety, another about elevators, we make it possible for small groups with special interests to dominate the political judgments involved. It is this situation that gives rise to the stories that master plumbers and plumbers' unions collaborate in preventing the authorization of new cost-saving materials and methods. So long as the only issue for decision by the legislature is in the realm of technology of plumbing, no one else will show up at the public hearing because the larger groups cannot see how their interest is involved or what they can effectively say.

If, however, the question before the council or the rule-making body is the adoption of a housing code dealing

broadly with every phase of safety and amenity in living while encouraging the provision of economical modern homes—then you have a political issue of exciting scope. Then you may expect the consumer groups, the public interest groups, the social welfare groups—in short, the groups on whom you have to rely for backing in every advance achieved in public health work—to make themselves heard, to give the rulemakers backing for progressive steps. The arena will not be left to special interest groups by default. It will be occupied by progressive thinking people who want to enjoy more comfortable, healthful, economical living which accords with technological advance.

Housing regulation is thus seen to be an area in which an evolving scientific standard is being advanced to modify a traditional standard of property values. In setting the standard by the processes I have suggested, successful administrative regulation requires a compelling body of data to support the standard. And even more, successful enforcement requires compelling evidence that the standard has not been respected. The appraisal technique of the Subcommittee on the Hygiene of Housing should prove of great value in both these steps.

Under our democratic system, if finality is to be accorded the administrator's decision in construing the facts, the processes by which he operates must be disclosed. This is the area that the administrative lawyers have plowed most intensively. There is nothing peculiar to housing regulation that the health officer has not encountered in his attempts to regulate milk producers, bakeries, summer camps. The steps that can be taken to avoid the charge of combining prosecutor, witness, and judge have been tried out in the Department of Agriculture, and in labor boards. Health departments might experiment with using the trained hearing

officer as a sort of preliminary judge, within the framework of the department, to weigh the testimony of inspector and owner without all the formal limitations of the common-law courtroom, yet with enough record of quasi-judicial process of notice and opportunity to be heard to enable a court to refrain from substituting its judgment for that of the department. We have the record of an ordinance in Newark, N. J., providing for such machinery, but the wartime housing shortage practically compelled the city to stop substantial enforcement so that there is little experience under the ordinance.

This paper could have been devoted to a systematic exposition, in familiar administrative law terms, of the recognized steps in the quasi-judicial process. I could have used it to cover the conventional subject matter of a building code. Frankly, I thought I could help the health officer most by painting some broad background considerations to encourage him to believe that a group of men with distinctly different training and ways of looking at things has a contribution to make toward reaching goals in which he is interested. Don't be shy of them; invite them to your councils. Listen, if they talk about the experiences of a labor relations board or a grain-grading administration. Bear in mind, too, that they are talking about ideas that lie within the provinces of law and government. One of my friends wrote a book, *Administrative Regulation*; two others wrote *Regulatory Administration*. These are not plays on words alone; they recognize two faces of the same coin.

Health officers must not let themselves get into such a frame of mind that they think they have objective sciences as their discipline whereas the administrative lawyer deals in nebulous words and phrases. Building codes habitually deal in "safety factors" of four or six. These phrases are not im-



posed by lawyers and administrators. They are a short-hand way of saying that after the engineer's best calculations he is still not in a position to state with certainty what the minimum requirement shall be, so he had better increase it fourfold or sixfold.

And get together, too, with the men concerned with city planning. I recently attended a state-wide meeting of local officials in which the control of land and buildings was being discussed simultaneously in three adjacent rooms by three assemblages—building officials in one room, city attorneys in another, planning officials in a third. It is hard to recall the historic forces that have led to such complete lack of communication between technicians with large areas of common concern. Health codes, housing codes, building codes, and zoning ordinances deal with some of the same elements, for example, the quantity and shape of open spaces to be maintained on the lot. Perhaps, before we can expect united public support for our ideas, we had better get together and show the public that we have a united, coördinated set of ideas.

And even in our most 'technical moments, let us never forget that we are, in our small way, concerned with the greatest issues of human society—authority and freedom, the rights of the

group against the rights of the individual. That this issue has not been settled in two thousand years by the greatest political philosophers may cheer us a bit, but it should serve too, to keep us humble. We can hardly expect to find a permanent resolution of it in a year or two.

#### 1. COMMITTEE ON THE HYGIENE OF HOUSING—REFERENCES:

Winslow, C.-E. A. Opportunities and Responsibilities of the Health Officer in Connection with the Federal Housing Acts. *A.J.P.H.*, 28:1269 (Nov.), 1938.

Winslow, C.-E. A. *Chairman*, Committee on the Hygiene of Housing. Basic Principles of Healthful Housing. Preliminary Report. *A.J.P.H.*, 28:351 (Mar.), 1938.

Winslow, C.-E. A. *Chairman*, Report of the Subcommittee on the Hygiene of Housing. *Year Book*, 1939, p. 27.

Lloyd, Morton G. *Chairman*, Report of the Subcommittee on the Hygiene of Housing. Housing Codes. *Year Book*, 1940, p. 47.

Winslow, C.-E. A. *Chairman*, Report of the Subcommittee on the Hygiene of Housing. *Year Book*, 1941, p. 61.

Winslow, C.-E. A. *Chairman*, Report of the Subcommittee on the Hygiene of Housing. The Improvement of Local Housing Regulation Under the Law: An Exploration of Essential Principles. *A.J.P.H.*, 32:1263 (Nov.), 1942.

Lloyd, Morton G. *Chairman*, Report of the Subcommittee on the Hygiene of Housing. Housing Codes. *Year Book*, 1942, p. 62.

Winslow, C.-E. A. *Chairman*, Report of the Committee on the Hygiene of Housing. A New Method for Measuring the Quality of Urban Housing. *A.J.P.H.*, 33:729 (June), 1943.

Editorial. Housing Inspection—1945 Model. *A.J.P.H.*, 35:511 (May), 1945.

Winslow, C.-E. A. Housing and Public Health. *A.J.P.H.*, 35:18 (Jan.), 1945.

Wolman, Abel. Association Progress in 1944. *A.J.P.H.*, 35:1 (Jan.), 1945.

## British Conference on Tuberculosis

The National Association for the Prevention of Tuberculosis of Great Britain announces a conference on tuberculosis in London from July 8 to 10. Although there will be special reference to the problem as affecting the British Commonwealth of Nations, the conference will deal with tuberculosis in all its aspects. Representatives from all the Dominions and Colonies have

been invited. Plans are also being made for overseas guests to see something of the anti-tuberculosis work in Great Britain. The conference is open to both doctors and laymen from all parts of the world. Particulars can be secured from the Secretary General, National Association for the Prevention of Tuberculosis, Tavistock House North, Tavistock Square, London W. C. 1.

# Ideal Intake of Calories and Specific Nutrients\*

FREDRICK J. STARE, M.D., F.A.P.H.A.

*Department of Nutrition, Harvard School of Public Health,  
Boston, Mass.*

THE topic assigned to me is entitled: "The Problem of Working Toward an Ideal Intake of Calories and Specific Nutrients." If one thinks carefully about this topic—calories and specific nutrients—it really embraces the entire subject of nutrition. One might paraphrase the topic as follows: "The Problem of Working Toward Ideal Nutrition." As long as I do not attempt to define ideal nutrition, I shall probably steer clear of abstract arguments which will get none of us very far, unless we want to agree that an ideal intake of calories and specific nutrients, that is, ideal nutrition, is that intake which permits the development and maintenance of ideal health. I shall not attempt a definition of ideal health or a discussion of ways and means for evaluating health.

The problem of working toward an ideal intake of nutrients may be divided into three main phases:

First—evercontinuing research in nutrition to determine what is the ideal intake of calories, iron, calcium, ascorbic acid, and other nutrients throughout life so as to favor ideal health. This involves research on many fronts. Do we know all of the nutrients required by man? What are the intakes of various nutrients which best lead to improved health? How far can one carry out Dr. Sherman's concept of

"the nutritional improvability of the normal"?<sup>1</sup> In thinking of the ideal intake of nutrients, one must differentiate from minimum requirements. It is quite likely that minimum requirements of any nutrient for health, determined under carefully controlled conditions, are considerably less than ideal intakes under practical conditions. For example we feel that minimum protein requirements for normal adults to maintain nitrogen equilibrium and apparent good health are approximately 30 gm. per day, providing caloric intake is sufficient to maintain an ideal body weight. However, we would say that an ideal intake of protein would be nearer to the *Recommended Dietary Allowances* of 70 gm. per day. The same reasoning might apply to most any nutrient, and I think on the basis of what evidence is available today one could say that the nutrient levels 'as given in the National Research Council's *Recommended Dietary Allowances*<sup>2</sup> come as close as any information we have on ideal intakes, with the exception of calories, as I shall mention later. Just as long as one refers to the recommended allowances as allowances or ideal intakes, and not requirements, we are on safe ground, and for ideal nutrient intakes concerned with health, one should err on the side of liberality. Researches on intakes of nutrients must go hand in hand with studies on methods of measuring nutrients, studies of the function of nutrients, and evaluation of

\* Presented before the Food and Nutrition Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 11, 1946.

physical and mental fitness and health.

An ideal intake of calories and specific nutrients has increased importance during growth, as has been widely practised in pediatrics for many years. Unfortunately many forget that adolescence is also a period of rapid growth. Probably less is known about the nutritional demands during adolescence than any other period of life. Likewise less emphasis is devoted to nutrition education designed for adolescents.

Of recent years the nutrient intakes during pregnancy have received increased attention and investigation. We can now better define ideal intakes for the pregnant woman as related to her health during pregnancy and postpartum and the health of her infant.

The problem of working toward an ideal intake of calories and specific nutrients must be individualized when applied to those seeking medical advice and, indeed, it takes on special emphasis under such conditions. Loss of appetite is a symptom common to most diseases, and thus intake of essential nutrients is decreased. In diseases accompanied by chronic diarrhea or poor absorption, maintenance of adequate nutrient intake is a major therapeutic problem. Convalescence, wound healing, bone growth, and blood formation all are favored by improved nutrient intake.

Occasionally one is asked: "Will we not soon know all that needs to be known about foods and nutrition and intakes for ideal health?" It is true that remarkable advances have been made in the science of nutrition in recent years, but to anyone even remotely aware of the quantitative limitations of nutritional knowledge, particularly in its application for improved health, it is far more likely to expect increasing rather than decreasing results from nutrition research.

The second major aspect of the problem of working toward an ideal intake of calories and specific nutrients is that

of nutrition education. Information from the laboratory and the clinic must be carried over to the people in such form and with sufficient emphasis that it helps mold customs on a sound nutritional basis. Information from the laboratory must be carried to those professional people dealing with health, for it will make them better able to carry out their responsibilities. Nutrition can be well and effectively taught both to the public and to professional people.

Where should one start in this problem of public education in nutrition? There are two fields that I believe are particularly promising: One, groups of children which would involve the elementary and secondary schools; and the second, the community which takes in adults as well as children. In the elementary schools, the junior and senior high schools, both public and private schools, the boy scouts, girl scouts, Junior Red Cross, and similar groups are the places where education in food and nutrition should be started and emphasized. To do this effectively requires an organized effort to introduce sound nutrition into the curricula of the elementary and secondary schools and into the curricula of the teachers' colleges. Until teachers themselves receive adequate training in basic nutrition, and in the application of this information to teaching, the inclusion of nutrition education into the daily teaching of children will be delayed.

Nutrition education is a part of health education and should be taught as such since good nutrition is essential to good health, both physical and mental. As with health education, the best results will be obtained when there is constant emphasis in *all* subject matter. Nutrition education falls naturally into the social studies and science; however, there is ample opportunity to make it function as a part of arithmetic, reading, or spelling.

Where should one start in introducing

nutrition into professional education? Again I think that best results will accrue if some instruction is included in each of the years of professional education, rather than have it all concentrated into one course. In medical education, nutrition can be well integrated with the regular medical curriculum and can be appropriately and effectively introduced during each of the four years of the standard medical course.

Nutrition education at any level is of little value if it does not carry over and result in daily use. Hence it is necessary continually to evaluate the results of nutrition, to investigate new techniques in education, and to change methods when more effective educational techniques are designed.

The third phase of the problem of working toward an ideal intake of calories and of specific nutrients is economic. Even as research yields factual information on what makes up ideal nutrition, and educational advances spread widely this information, an individual must have purchasing power to obtain the right foods, and there must be enough of the right foods properly distributed to supply all people. Attention was focused on this problem about ten years ago with the report of the Mixed Committee of the League of Nations. More recently the United Nations at the Hot Springs Food Conference and the meetings of F.A.O. have again emphasized food consumption deficiencies and food production deficiencies when considered on a world-wide basis. The Hot Springs Conference reported as follows: "There has never been enough food for the health of all people. Production of food must be greatly expanded; we now have knowledge of the means by which this can be done. It requires imagination and firm will on the part of each government and people to make use of that knowledge."

There is yet another facet of the problem of nutrition which demands atten-

tion, and which involves all three of the broad phases—research, education, and economics—that I have mentioned. That is the effect of nutrition, both good and poor, on man's social behavior. It can fairly be said that food is man's most basic environmental need. Man must eat. What man does or does not eat influences his behavior. The fundamental unity of mankind, peace in one world, no more wars—whatever expression you wish to use to describe what all of us desire but what we seem to be so muddled in trying to obtain—this spirit of good will depends on man's social behavior, which is influenced by food. Surely this problem of food, of nutrition and social behavior, is so fundamental to the concept of one world that it should receive preëminence in the plans of those who hope to bridge the chasms which exist between nations.

What do we need to be ideally nourished? What is an ideal intake of calories and specific nutrients? If we are to be strictly scientific, I do not think we know the answers to these questions—at least I do not. But we have considerable information helpful in approaching this ideal. There is probably more and better information available on an ideal intake of calories for man than for any of the specific nutrients, and yet we pay relatively little attention to this information. Generally it is not emphasized in nutrition education.

Life insurance statistics have consistently shown an increased mortality among those who are overweight. Dublin analyzed the influence of weight on the duration of life of nearly 200,000 men, and concluded that "the penalty of overweight is one-fourth to three-fourths in mortality." The increased mortality from overweight is much greater in persons beyond 35 to 40 years of age. Obesity is a dangerous condition. It increases susceptibility to diabetes mellitus, gall-bladder disease,

arteriosclerosis, gout, chronic bronchitis, pulmonary emphysema, surgical risk, and the many conditions generally classified as "degenerative diseases."

An interesting paper in the *Journal of the American Medical Association*<sup>3</sup> this past summer reports some startling information on the prognostic significance of overweight alone, and when associated with transient hypertension and transient tachycardia. The paper presents an analysis of the medical records of nearly 23,000 army officers. The indexes chosen to demonstrate the influence of overweight on the state of health were the development of sustained hypertension and retirement or death with cardiovascular-renal diseases. Overweight alone showed significantly higher rates for later sustained hypertension than the control group, and when associated with transient hypertension and tachycardia the rate of the later development of sustained hypertension was twelve times as great as in the controls. There is no question but that overweight is dangerous to health, particularly when associated with transient hypertension and tachycardia, two conditions which are not uncommon in this country.

An interesting question that can be posed in a discussion of caloric intake is whether the treatment of obesity produces favorable results on improved health and length of life. So far as I know, this is a question that has not been given extensive study and for which there is no convincing evidence either way. Undoubtedly there are factors of degree and time involved. That is, an individual may be overweight to a certain degree and for a certain length of time and if returned to ideal weight will probably experience minimum or no impairment of health. On the other hand, a patient who has been overweight for some years, who seeks treatment because of diabetes, gall-bladder disease, or hypertension, and as part of

the treatment is reduced in weight—is that patient's health and life span improved by a lowered caloric intake? While a reduced caloric intake is part of the standard treatment in such diseases, I know of no statistical study or real evidence that any gain in health or life expectancy is obtained by it. Thus the preventive aspects of overweight may be of far greater benefit to health than the therapeutic aspects. In this regard mention should be made of reports following both world wars, of the improved general health status of individuals who were overweight and had been ill with diabetes, arteriosclerosis, and hypertension.

All obesity is nutritional. All obesity is caused by overeating, by consuming more calories than one expends. Obesity is usually classified as simple or endocrine depending upon whether it is associated with any demonstrable endocrine disorder. The latter cases are rare, generally involve an unusual distribution of the fat, and even then obesity results from consuming more calories than one expends. Why does anyone overeat? There are many reasons, and Newburgh<sup>4</sup> who has made many studies of obese patients lists the following:

1. because the habit has been inculcated by the overzealous or misguided mother;
2. because great gratification is obtained from the flavors of foods;
3. because the full stomach produces a feeling of repose and comfort;
4. because some people who are struggling with difficulties which they cannot master obtain temporary respite by indulging in food;
5. because persons whose need for food is lessened by disabling illness or by the advent of an endocrine disease that lowers the metabolic rate, may not experience a shrinkage of the appetite that corresponds with the smaller need;
6. because the requirement for food is greater in youth than it is in later years, but the food habits of the earlier years may still hold sway in middle age.

It is interesting to note that the body has no adequate protective mechanism

to guard against excessive caloric intake as it does in the case of many other nutrients. The ability to absorb some nutrients, for example calcium and iron, is favorably influenced by the need for the nutrient. Water soluble nutrients, for example the water soluble vitamins, are excreted at an increased level when the need is less. Excessive protein intake results in increased nitrogen excretion. But calories from fat and carbohydrate consumed above the metabolic needs are stored.

Since overweight or obesity is definitely dangerous to health, since it is caused only by consuming more calories than one expends, since it is a condition in which prevention rather than therapy may be of greater importance to health, and since it is entirely preventable, it would appear that an intake of calories appropriate to maintain ideal weight should be given considerable emphasis in nutrition education. Seldom have I heard a nutritionist give any attention to ideal weights as part of nutrition education. I doubt if there are many nutritionists who have a very clear idea of what their own ideal body weight is. Most of nutrition education has been designed to portray the "newer knowledge of nutrition," promote a greater consumption of the "protective foods" of milk, green and yellow vegetables, citrus fruits, the "basic seven," etc., and in general has followed the slogan which I believe was coined by Dr. McCollum—"eat what you want after you have eaten what you should."

Certainly it was in the interests of improved health to encourage the consumption of foods rich in vitamins, minerals, and good quality protein, but it is likewise in the interests of improved health to drive home to people the dangers of overweight and the importance of consuming calories so as to maintain weight at approximately the ideal weight. I think the disregard of the impairment of health by consuming

too many calories has been the single big defect in nutrition education. McCollum's slogan might better be "eat to your ideal body weight after you have eaten what you should." Likewise I feel it would be an improvement in the National Research Council's *Recommended Dietary Allowances* if no figure were given for a caloric intake but rather a statement to the effect that calories should be consumed so as to approximate ideal weight. The table might well include ideal weights for men and women of average height. On an individual basis, I know of no simpler nor more important health practice for adults than to keep a written record of monthly weight. When weight starts to climb above the ideal weight, caloric intake should be promptly reduced while it still requires little reduction to bring about the desired result.

A word as to the meaning of ideal weights versus average weights is probably in order. As far as I know, the term ideal weight was coined by the Life Extension Institute and is reported by Dr. Fisk in his book *Health Building and Life Extension*.<sup>5</sup> From an analysis of thousands of life insurance statistics, it was found that individuals conforming closely throughout adulthood to the average weight for any given height at age 30, have the lowest death rate. Thus average weights for men and women of specified heights at age 30 are known as ideal weight. Individuals who maintain this ideal weight throughout adulthood have the lowest death rate. Some allowance may be made for the physical type of the individual. This is generally a 10 per cent decrease for those with a slender skeletal framework and a 10 per cent increase with individuals of heavy framework. But even so, Fisk states that life insurance companies find an added death rate in any overweight group regardless of skeletal framework. Average weights are higher than ideal weights because

they are influenced by the weights of those persons who put on added weight during middle life. The term normal weight is generally used in the same meaning as ideal weight, that is, average weight for height at age 30.

For children, the ideal weights for heights and sex data widely accepted are the standards of the Child Health Association which are average figures compiled from large numbers of healthy children from birth through the age of 18 years.

Thus I feel that the problem of working toward an ideal intake of calories is important, that it is a problem nutrition education has completely ignored, and yet the solution is simple. A real effort on the part of nutritionists should be made to inform people of the dangers of overweight and to teach them that obesity is an entirely preventable disease. School physicians, home economists, and health educators should take the responsibility of teaching children in the senior high schools the penalty of overeating in adulthood. Physicians who have patients with chronic diseases that require prolonged bed rest or limited physical activity should see that

the diet is planned to avoid the insidious gain of excessive weight.

As Newburgh points out, "The chronicity of overweight and its lack of immediately disabling features and severe pain, make it easy to find excuses for delaying treatment or for being lax about it. Most people are unaware of the threat to life that excessive calorie intake involves and they can scarcely be expected to take their condition seriously until they acquire the information." Personally I feel that excessive calorie intake is the single most extensive nutritional problem affecting public health in this country. It would be largely solved if we could get the idea across to "eat to your ideal weight after you have eaten what you should."

#### REFERENCES

1. Sherman, Henry C. *The Science of Nutrition*. Columbia University Press, 1943.
2. National Research Council. *Recommended Dietary Allowances*. Reprint and Circular Series No. 122, Aug., 1945.
3. Levy, R. L., White, P. D., Stroud, W. D., and Hillman, C. C. Overweight. *J.A.M.A.*, 131:951 (July 20), 1946.
4. Newburgh, L. H. Obesity. *Arch. Int. Med.*, 70:919 (Dec.), 1942.
5. Fisk, Eugene Lyman. *Health Building and Life Extension*. Macmillan, 1923.

# Effect of Restricted Feeding Upon Aging and Chronic Diseases in Rats and Dogs<sup>\*</sup>

C. M. McCAY, PH.D.

*Professor of Animal Nutrition, Cornell University, Ithaca, N. Y.*

IN our modern age of nutrition the theory has been dominant that the body should be supplied with an excess of essential nutrients from the cradle to the grave. We have attempted to force the growth of animals such as chickens, swine, babies, and puppies to the maximum. We have read of balance experiments, run with inorganic elements such as calcium, in which the maximum need was indicated by the data itself. Then we have observed nutrition students increasing this level in establishing a so-called "limit of safety." We have also read experimental evidence that an animal did not store calcium in maximum capacity during growth or that a lactating animal failed to maintain a balance of calcium during the early months of lactation. Invariably, authors have concluded that such conditions were defects within the metabolism of the animal and that our goal should be to correct these defects.

On the other hand, little attention has been given to possible advantages of the ingestion of low levels of nutrients during at least certain periods of the life cycle of men and animals. Many factors have undoubtedly shaped this philosophy of nutrition. The outstanding one has probably been the short-time character of most experiments.

To date most research studies have considered only a brief fraction of the total span of life of men or animals. Except in special areas, such as that concerned with efficiency in the performance of work or in the resistance to diseases of bacterial origin, short-time studies give little evidence of possible interrelationships between the level of ingestion of nutrients and the performance of an animal or man during the whole span of life.

Inasmuch as nutrition research has made many of its advances in the course of studying farm animals, it tends to have its philosophy colored by these investigations even when the results are applied to human beings. In rearing farm animals such as swine, poultry, and beef cattle, for meat the factor of dominant importance is always the cost in terms of feed and labor to produce a pound of human food. Under most conditions the more rapidly an animal grows, the more efficiently it converts feedstuff into body tissues. Inasmuch as most meat producing animals are slaughtered before they have completed more than a third of their total span of life, little attention is paid to any factor other than a feeding program that will maintain health and efficient conversion of feedstuffs until the time of slaughter.

However, recent studies in England have devoted considerable attention to the alteration in anatomical structure of farm animals by severe restriction of

<sup>\*</sup> Presented before the Food and Nutrition Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 12, 1946.



essential nutrients during the growing period.<sup>1</sup> These afford interesting possibilities for complementary action between the inheritance of body structure and modifications during growth. In last analysis, however, the practical use of such studies depends upon the efficiency of conversion of nutrients into meat.

Human beings, however, are supposedly reared for the purpose of optimum productivity during a whole span of life.

This brief discussion of farm animals is introduced by way of contrast in order to define sharply our thinking in regard to objectives. In one case we are converting feedstuffs into meat; in the other we are attempting to produce human beings who can enjoy optimum health and hence perform a maximum of useful work during the whole span of life.

In order further to clarify our philosophy, brief consideration should be given to our major objective in research in the field of aging or gerontology. The opinion is rather general that researchers are attempting to drag out the period of decrepit old age with its resulting vast economic burden due to illness and dependence. Quite the opposite is the case, since the objective of research upon aging is the discovery of ways of maintaining optimum health during the declining years of the life span so that this burden due to dependence will be alleviated.

From this introduction it might seem that applied agriculture has little interest in research in gerontology other than that the farm population must bear its share of the burden of the aged who become ill so they cannot carry their portion of farm labor. This is not entirely true since it is economically important for certain classes of livestock to have a long adult life. In different parts of New York State the average dairy cow has a productive life of only

5 to 7 years. However, the potential productive life of the cow is about 20 years. In this case a long productive life is economical. In fact, one group of Jersey and Guernsey breeders have favored a restricted diet during growth for these two breeds of cows in order to produce the best types and the most productive animals. Like the Shetland pony, these breeds originated on islands where the limited supply of food retarded the growth and restricted the ultimate body size.

#### LOW ENERGY DIETS

For centuries there are records of individuals, religious sects, and geographical areas in which people from choice or necessity passed much of their lives upon diets that barely prevented starvation. One of the greatest advocates of such nutrition was Luigi Cornaro (1464-1566). His book passed through a number of editions and was published in America in 1917 under the title of *Art of Long Living*. He advocated a very simple diet of about 14 ounces of food per day. This consisted of soup, bread, and an egg each day, with a small addition of meat for those who could afford it. Of course, Cornaro drank wine instead of water with his simple diet.

One can find other records of such human diets. However, we can draw few satisfactory conclusions about results because we know too little about the quality of the food and the many other variables that influenced the lives of these men. From the viewpoint of modern nutrition it seems difficult to understand how men like Cornaro survived. It is equally difficult to understand how the poor of many lands have lived for centuries upon simple diets. When we add together the twenty-five to fifty vitamins, fatty acids, inorganic elements, and amino acids that are recognized today as essential constituents of human food, it is almost

unbelievable that survival was possible, especially after men started to process and destroy natural foods.

This complex problem of providing a diet in minimum amounts that will provide optimum levels of all essential nutrients has been stressed because it is a matter of supreme importance to basic research in animal experiments. Until modern times the effects from both human experience during periods of famine, and of animal experiments in the laboratory in feeding low energy diets, were confused because such diets under both conditions were usually deficient, not only in calories but in numerous other essentials such as proteins, calcium, and vitamins.

Before proceeding with a brief discussion of controlled experiments with animals, it may be well to review one of the outstanding records of human experience, namely the studies of Chadwick.<sup>2</sup> Edwin Chadwick (1800–1890) is best known as a lawyer-sanitarian who pioneered in England a century ago in the improvement of sanitation, housing, education, and factory labor conditions. Even today most of us can well afford to have constantly before us for rereading, the great works of Chadwick edited by B. W. Richardson under the title of the *Health of Nations*.

Chadwick's contributions to our knowledge of low energy diets resulted from a comparative survey of prison diets used in England. His study was made in coöperation with the statistician William Farr in the years 1830–1832.

Due to the diversity in food allowed in the 128 prisons under study it was found that these prisons could be divided into three classes. In one only 128 ounces of solid food were allowed per week, in the intermediate class the allowance was 213 ounces, and in the highest 218. These two latter were close together on amounts but differed considerably in the money expended.

At this period in England, agricultural laborers consumed only 122 ounces of food weekly. Unfortunately we cannot calculate these diets into modern terms of proteins, fats, etc.

The outstanding results of this study were the much lower death rates in the prisons using the lowest food allowances in comparison with the other two. Chadwick concluded, "The average excess of sickness which was the concomitant of the excessive forms of dietary, amounted to no fewer than five thousand-eight hundred and eighty-two cases per annum, yielding an unnecessary mortality of ninety-four." Although there is no mistaking the conclusions of Chadwick it is difficult to fit them to the meager data upon illness cited by Richardson. If the original data were available it would be interesting to repeat the calculations using modern methods.

Inasmuch as we have reviewed the literature elsewhere in the limited field of animal research dealing with the interrelationships between restricted diets, growth rate, and the diseases of old age, we will only consider a few earlier works at this time.<sup>3</sup> Jackson has provided thorough reviews upon the general subject of inanition.<sup>4</sup>

One of the earlier studies, that have been forgotten in modern times is that of Moreschi.<sup>5</sup> He extended earlier British observations indicating that restriction of foods slowed or prevented the growth of tumors in animals. In his studies with mice Moreschi transplanted tumors and followed their rate of growth. He found the tumor grew in relation to the amount of food allowed the animal. Mice fed on restricted diets lived longer. Under some conditions of restricted diet he found it difficult to transplant tumors.

These original findings of Moreschi which have been rediscovered in modern times were probably neglected because Rous made a similar study with rats<sup>6</sup>

and failed to get any effect from restriction of the diet. In the report of Rous, there is no evidence, however, that the results of Moreschi with mice were in question.

In addition to interest in diseases in the study of restricted diets, another outstanding problem concerns the ability of an immature animal to resume growth after long periods of retardation. For nearly twenty years we have given attention to this problem, using several species, namely, the dog, the rat, and the brook trout.

Although the use of restricted diets offers vast opportunities in the modification of types within breeds of dogs, little attention has been given to this subject. In 1911, Aron<sup>7</sup> reported a few studies with mongrel puppies in which he retarded the growth by the restriction of food. Under such conditions he found that the skeleton continued its growth to a limited extent. After a puppy was restricted for 350 days it seemed to have lost its ability to resume growth and attain a normal size.

In two preliminary studies using dogs of known breeds we have extended this work.<sup>8,9</sup> In the first, a litter of five Saluki pups was used. Three of these were allowed to grow normally and two were retarded until 440 days of age with the restricted diet starting when the pups were 3 months old. The growth of the tibia in each pup was followed by means of x-ray photographs made at regular intervals. There was slow growth of the bones during the first 300 days of the study. After re-alimentation there was no evidence that the retarded pups could attain the size of the control animals.

Dr. W. T. James made a number of studies upon these dogs to determine if there were differences in rate of learning. He found none. He did find a lower heart and breathing rate in the retarded dogs. When required to perform a given amount of work such as

walking there was obviously a greater strain on the body of the underfed. Housed in a warm kennel, but provided with an outdoor run, these Salukis, which are naturally as thin as greyhounds and have limited hair protection, survived a cold winter.

A second experiment was completed just prior to the war using three long haired terrier puppies from a Scotch-Cairn cross. Two of these were females and one was a male. When 65 days old the male and one female puppy were started upon a restricted diet designed to provide an adequate intake of all essential nutrients except energy, even when fed at maintenance levels. The other female puppy was given all the food desired.

All puppies weighed 4 pounds at the start of the study. At the age of 357 days the two retarded animals weighed slightly more than 9 pounds each, while the control weighed 15. Re-alimentation started at that time. At the conclusion of the study when the pups were 374 days old, the control female and the retarded male weighed 15 pounds while the retarded female weighed 13.5 pounds. Careful measurement of the leg and head bones indicated that the size of the skeleton was proportional to the body weight.

Both of these preliminary studies with dogs confirm the findings of Aron that if dogs are maintained upon restricted diets so that growth is retarded for a period of a year, the animal loses its power to attain full adult size. In the second study the pups were kept in unheated kennels and had no difficulty in surviving a cold winter. The retarded pups were exceptionally active and alert. Contrary to normal dogs they were so hungry that they would eat dog meat if offered them. Thus hunger drove them to cannibalism.

#### STUDIES WITH WHITE RATS

Some of the finest papers of the late

Professor L. B. Mendel were concerned with the problem of the suppression of growth and the capacity to grow.<sup>10</sup> He was able to retard the growth of rats for more than a year. In one case he kept a rat on a restricted diet for 532 days and found it still retained the capacity to grow. Since Mendel's work in 1914, advances in our knowledge of nutrition have permitted the design of superior diets. Today we can feed mixtures enriched in essential nutrients so that we are more certain of providing for needs of the body if we wish to restrict the growth by limiting the energy intake.

Of course we can never be sure of the ultimate limiting factor under such conditions. When calories are severely restricted, the body may utilize essential amino acids or even vitamins for fuel. Hence these may be the ultimate units that prevent normal growth.

Since 1930 our studies upon aging in rats have been of three types: In the first we have retarded rats for long periods and determined the effects in terms of diseases that developed and the total span of life.<sup>11</sup> In the second we have introduced dietary variables in the middle of the life span when rats were about a year old.<sup>12</sup> In the third, various attempts have been made to improve normal human diets by the addition of natural foods.<sup>13</sup>

Three long series of these restricted diet studies have been completed since 1930. All have given similar results. Rats long retarded by diets with excess of recognized essential nutrients, but inadequate in energy allowance to permit growth, far exceed the normal span of life for their species. The oldest rat thus far lived 1,456 days, while the normal span of life for a white rat is about two years.

The growth impulse of rats maintained upon restricted diets for long periods persists strongly for 900 days. After this it tends to decline and is lost

in various individuals. In one case it persisted in a rat for 1,150 days. When such rats are re-alimented and resume growth even after 900 days they always fall short of attaining the adult size that would have been achieved if they had grown normally from an early age. Thus, in one series of studies the length of the tibia varied from 3.8 to 4.1 cm. for normal adult males, while the mean lengths for those retarded 300 and 900 days respectively were 3.7 and 3.5 cm.

Of all the organs and tissues of the body the bones seem the most persistent in maintaining their growth. Likewise, in retarded animals the bones seem to persist in the deterioration of old age through the loss of inorganic materials. Thus they become thin and fragile or we may say "old" in rats prevented from attaining adult size beyond their normal span of life. At the same time these bones are aging, other parts of the body such as the hair maintain their youthful character.

From our earliest studies it was evident that the retardation of growth upon diets of excellent quality, but restricted in amount, resulted in a long span of life because the retarded rat was less subject to the usual terminal diseases that start in the second year. Thus in the first series of studies made in the early '30's no tumors were observed among retarded rats until after they were allowed to grow. On the other hand, about 12 per cent of the rats allowed to develop normally had tumors. However, the organ that seems to fail first in rats is the lung. Second to this organ are probably the kidneys. In old age the rat seems to have little trouble with the heart and blood vessels.

In the first two series of retarded growth studies only limited attention was paid to pathology. In the course of this research it became evident that teamwork between nutrition and pathology afforded the most effective method devised thus far for attacking the

problem of chronic diseases of old age.

The third large study started in 1939 and involved 500 rats. Some of these were killed at regular intervals, in order to follow the development of chronic diseases. Dr. John A. Saxton, Jr., has published a number of summaries of observations upon these rats.<sup>14</sup> He has found that the chronic pneumonia which seems to terminate the lives of most old rats, develops much more slowly in those fed restricted diets and thus retarded in growth. The elasticity of the lung tissue seems to be better maintained in these underfed animals.

In order to penetrate still further behind the pathological picture, Dr. O. H. Lowry and associates<sup>15</sup> have attempted to apply histochemical methods to the study of the tissues of some of these rats. They found the kidney tissues afforded most evidence of changes with age. They believed the restriction in calories may have favored this organ in keeping it younger in retarded animals. Inasmuch as the daily ingestion of proteins, vitamins, and inorganic constituents was kept the same for all rats, the aging of or injury to the kidneys in normal rats could not be referred to any of the classical reasons such as a difference in the amount of nitrogen excreted daily. This burden was the same for all animals. Hence the kidney changes must have been associated with aging. However, in this case the retarded animals seemed to have maintained "younger" kidneys just as they did more elastic lungs.

The restriction of calories during the latter half of life is also effective in extending the total span of life of the rat just as it is in the case of man.<sup>12</sup> However, this extension is small compared to that resulting from severe limitation of calories during the growing period.

Little research has been directed toward either restriction of special nutrients or the effect of specific excesses

upon the diseases of old age. Kon has indicated that the absorption of calcium declines in old age,<sup>16</sup> so that the allowance should probably be increased. However, Shields and Mitchell<sup>17</sup> have found no evidence that higher levels of calcium in the diet extend the span of life of rats. It is probable that Kon was concerned with a border-line allowance of this element while Mitchell's lowest level made adequate provision for the needs in old age even with a decreased absorption rate.

In our own laboratories we have had experiments in progress during the past few years<sup>11</sup> in an attempt to answer three questions:

1. Will a moderate consumption of coffee equal to a cup per day for man modify the life span?
2. Can the typical diet consumed in the northeastern part of the United States be improved by supplementation with vitamin concentrates?
3. Can this diet be improved by changes suggested by modern nutrition such as the use of more organ meats, whole wheat bread, and milk?

These experiments have been described in detail elsewhere,<sup>11</sup> but the results can be expressed here in a few words. As far as the life span of the white rat can serve as a criterion, there is no evidence of improvement in this average human diet either by supplements of vitamins or by increases in such foods as liver, milk, and whole wheat bread. Furthermore, there is no evidence of modification of the life span from the daily ingestion of a moderate amount of coffee beverage. In fact, two groups of rats indicated significantly favorable responses to this beverage.

Following this study, small groups of rats were forced to consume no other beverage than coffee from the time of weaning. This study now has reached its third generation. In other words, two generations of rats have grown to maturity, reproduced and reared young,

with coffee to drink instead of water. The growth rates of the rats were slightly slower, but they attained the same adult size and seemed to have no trouble in reproduction. This study has not been extended to a consideration of the life span.

At present we are starting a new series of experiments to determine whether the daily ingestion of large amounts of fluid will tend to preserve the kidney against age changes in the rat. One of the variables in this study will be coffee. Another will be liquid milk. A technique has been devised by which the rat can be induced to consume three to five times as much water as it drinks normally. This technique is the same as that used previously in studying the effect of acid beverages upon teeth.<sup>18</sup> It makes use of the fact that a rat will drink much more of a solution containing 10 per cent sucrose than it will of water. The outcome will be known about four years from now.

#### SUMMARY

The purpose of all research upon aging is to find means of alleviating the chronic diseases of old age. Thus we can look forward to more productive years and less financial dependence in man. Severe restriction in food intake has long been advocated by individuals and certain sects. It has been essential in many nations. Until modern times, however, such restriction has had attendant risks since we were unfamiliar with numerous essentials that must be included in diets.

Studies with dogs and rats covering the past sixteen years have been reviewed. Puppies can be severely retarded in growth by restriction of food. They seem to suffer no ill effects in the course of a year even when kept in cold kennels during the winter. However, such puppies do not attain normal body size even when the restriction is maintained for only a year.

Three long-time experiments in maintaining rats during the growing period upon diets adequate in known essentials except calories indicate that the life span is much extended. This is due in part to the slower development of chronic diseases of the lungs in rats whose growth is retarded by diets low in energy value. Such diets and such slow growth also lead to a much lower incidence of tumors and possibly to less aging of special organs such as the kidneys and lungs.

Under conditions of restricted diets, bones seem to be the most persistent in their growth. However, rats, like puppies, retarded for even 300 days cannot attain normal adult size. However, rats seem to have more ability than other species to resume growth after long periods of suppression.

A few recent studies indicate that excess of special food substances does not succeed in extending the life span of rats by supplementing a normal human diet with either vitamins or by means considered especially worth while, such as additions of liver, whole wheat bread, and more milk. The ingestion of moderate amounts of coffee as a beverage had no unfavorable effect upon the life span of rats. New studies are under way in which the amount of liquid ingested daily is the principle variable.

#### REFERENCES

1. McMeekan, C. P. Growth and Development in the Pig, with Special Reference to Carcass Quality Characters. *J. Agr. Sci.*, 30: 276-343, 387-436, 511-568, 1940; 31:1-49, 1941.
2. Richardson, B. W. *The Health of Nations*. London, 1887, Vol. 1, p. 62.
3. McCay, C. M. Nutrition, Ageing and Longevity. *Tr. & Studies College of Physicians and Surgeons of Philadelphia*, 4 Ser., 10:1, 1942.
4. Jackson, C. M. *Inanition and Malnutrition*. Philadelphia, 1925.
5. Moersch, C. Beziehungen zwischen Ernährung und Tumorwachstum. *Ztschr. f. Immunitätsforsch.*, 2:651, 1909.
6. Rous, P. The Rate of Tumor Growth in Underfed Hosts. *Proc. Soc. Exper. Biol. & Med.*, 8:128, 1910-12.
7. Aron, H. Nutrition and Growth. *Philippine J. Sc.*, 6:1, 1911.

8. James, W. T., and McCay, C. M. An Analysis of the Effect of Retarded Growth on Behavior in Dogs. *J. Comp. Psychol.*, 37:173, 1944.
9. McCay, C. M. *The Nutrition of the Dog*. Ithaca, N. Y.: Comstock Publishing Co., 1946, p. 120.
10. Osborne, T. B., and Mendel, L. B. The Suppression of Growth and the Capacity to Grow. *J. Biol. Chem.*, 18:95, 1914.
11. McCay, C. M., Sperling, Gladys, and Barnes, L. L. Growth, Ageing, Chronic Diseases, and Life Span in Rats. *Arch. Biochem.*, 2:469, 1943.
12. Cowdry, E. V. *Problems of Ageing*. Baltimore: Williams & Wilkins, 1942, p. 694.
13. Sperling, Gladys, Loosli, J. K., Barnes, L. L., and McCay, C. M. Effect of Coffee, Human Diets and Inheritance upon the Life Span of Rats. *J. Gerontology* (in press).
14. Saxton, J. A., Jr., Barnes, L. L., and Sperling, Gladys. A Study of the Pathogenesis of Chronic Pulmonary Disease (Bronchiectasis) of Old Rats. *J. Gerontology*, 1:165, 1946.
15. Lowry, O. H., Hastings, A. B., McCay, C. M., and Brown, A. N. Histochemical Changes Associated with Ageing, IV. Liver, Brain and Kidney in the Rat. *J. Gerontology*, 1:345, 1946.
16. Kon, S. K. Milk in Relation to Human Nutrition. *J. Roy. Soc. Arts*, 93:122, 1945.
17. Shields, J. B., and Mitchell, H. H. The Effect of Excess Dietary Calcium on Longevity and Tissue Calcium in the Albino Rat. *J. Nutrition*, 32:213, 1946.
18. Gortner, R. A., Jr., McCay, C. M., Restarski, J. S., and Schlack, C. A. Some Effects of Dietary Oxalate on the Teeth of White Rats. *J. Nutrition*, 32:121, 1946.

---

## Apprenticeship Training in Public Health Nursing

The Division of Public Health Nursing of the New York State Health Department announces a plan for an apprenticeship in public health nursing. It is designed primarily for the young graduate nurse who wishes to try herself out in public health nursing before she decides upon a career. A period of field training service of from 4 to 12 months in a local health district will be provided at a recommended minimum salary of \$1,800, but depending on local salary standards. Upon successful

completion of an apprenticeship, the candidate is eligible to apply to the State Department of Health for a training fellowship in public health nursing at an approved university program of study in public health nursing. This training in turn meets civil service requirements for appointment as a public health nurse for field service.

Apply to Division of Public Health Nursing, New York State Dept. of Health, State Office Building, Albany 1, N. Y.

# Effect of Ultra-violet Irradiation of Classrooms on Spread of Measles in Large Rural Central Schools\*

## Preliminary Report

JAMES E. PERKINS, M.D., F.A.P.H.A.,  
ANNE M. BAHLKE, M.D., AND HILDA FREEMAN SILVERMAN

*New York State Department of Health, Albany, N. Y.*

STUDIES made in the past nine years by William Firth Wells and Mildred Weeks Wells<sup>1-4</sup> in Philadelphia and its suburbs on the effect of ultra-violet irradiation of classrooms on the spread of measles, chickenpox, and mumps in school children, have suggested that such irradiation has reduced the spread of these diseases, particularly measles, in the classrooms studied. In an attempt to repeat their observations, similar experiments have been undertaken by the New York State Department of Health† in three rural centralized schools in upstate New York.

Actual observations in these experiments did not begin until January, 1945, but the extensive measles epidemic which occurred in New York State in the winter of 1945-1946 makes this early preliminary epidemiological report possible.

The decision to conduct the study in centralized rural schools was determined primarily by their having certain characteristics which constitute highly de-

sirable experimental conditions. Obviously, a decisive demonstration would be most likely if the children under study associated with other children to only a very limited extent outside the environment under observation, in this instance the school environment. Such a situation is approximated in the rural school. In contrast to the experience of the city child, rural children enrolled in a centralized school have most of their contact with one another within the school environment, either in the school building or on the school bus.

Three schools were placed under observation: the Cato-Meridian, Port Byron, and Mexico Central Schools. The State Education Department prepared a list of a number of such schools in accordance with criteria established by us, and these three were chosen from that list because of their similarity and relative proximity to one another. All three were constructed within the past 10 years on the same general architectural plan and have essentially the same ventilating systems (central fans, zoned, capable of delivering 30 cu. ft. of air per minute per child). The floors throughout all three schools are waxed as needed with a commercial floor wax and all three are swept with mops treated with an oily, anti-dust preparation. All three supervising principals

\* Presented before the Epidemiology Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 14, 1946.

† This study has been made by a team of the department, with the various aspects represented as follows: epidemiological, Drs. Perkins and Bahlke; statistical, Hilda F. Silverman; engineering, C. R. Cox; and bacteriological, F. W. Gilcreas, assisted by Hazel V. Roberts.



and their boards were sympathetic with the experiment and were willing to give full coöperation. Each of the three schools has a full-time nurse and an adequate system of keeping health records. The pupil populations are comparable socially and economically, and each school has an enrollment of over 600 pupils: 620 in Cato-Meridian, 850 in Port Byron, and 900 in Mexico.

The Cato-Meridian and Port Byron schools are in Cayuga County, and the Mexico school is in adjacent Oswego County. The Cato-Meridian school is situated in a field half way between the villages of Cato and Meridian, which are two miles apart. Cato has a population of approximately 400, and Meridian 300. All the pupils in this school are transported in school buses. The Port Byron school is located in the village of Port Byron, which has about 950 inhabitants, and 80 per cent of the pupils ride to school in buses. The Mexico school is in the village of Mexico where the population numbers 1,350, and 70 per cent of these pupils ride the buses.

The Cato-Meridian school has been fully equipped throughout with ultra-violet lamps except for the gymnasium where there are technical obstacles to such installations. All three schools have at least two sections of each grade, and in Port Byron the room housing one section of each grade through the 8th is irradiated, whereas the room with the other section of each of these grades has no ultra-violet lamps, and thus serves as a control. All places of common congregation within the school (again except for the gymnasium) are irradiated. The Mexico school, with no ultra-violet lamps, serves as a wholly unirradiated control school.

Dr. L. J. Buttolph of the General Electric Company has acted as the consultant lighting engineer in the study. He determined the nature of the original installations and has supervised their

maintenance. Irradiation throughout is by the indirect method with the shielded fixtures suspended about 7 ft. from the floor. The fixtures are of the wall-attached, trough-like type, equipped with an "Alzak" finished aluminum reflector in the shape of a cylindrical parabola. Each fixture is equipped with a 30 watt low pressure mercury vapor germicidal lamp. The total number of fixtures per room varies from one in a few very small rooms to eight in the auditoria and cafeterias. The average classroom has three fixtures, one each on the front and rear walls, and one on the side wall opposite the windows. The hall fixtures are of a double trough type containing two 15 watt tubes per fixture, and are hung from the ceiling in the center of the corridor.

Measurements have been made regularly throughout the study of the radiation output from the lamps in both schools to assure their maintenance at proper operating levels. In general an attempt has been made to maintain an average ultra-violet light intensity of 10-20 milliwatts per sq. ft. throughout the upper air; and 0.2 to 0.5 milliwatts per sq. ft. (or microwatts per sq. cm.) at face level of standing pupils.

It should be noted that despite such vigilance several cases of conjunctivitis, erythema, and desquamation were encountered among the teachers of both schools. So far as could be determined, no pupils were affected. Since most of the faculty stand while teaching, this selectivity can be explained on the basis of a difference of facial levels in the two groups. The symptoms occurred for the most part in fair complexioned individuals and were due to stray radiation from imperfect fixtures or indirect radiation reflected from the highly reflective unpainted plaster ceilings. In every instance the situation was corrected either by applying adhesive tape to a portion of the reflectors or by disconnecting a lamp in the room. Such

measures did not cut the irradiation in the room below what were considered to be adequate levels.

Local arrangements were made with school personnel for periodic checking for burned out tubes, and weekly dusting of the tubes with a clean dry cloth.

Evaluation of results is an involved problem by virtue of the complexities of the environment in which the study is being performed. Such evaluation has been made from analysis of data obtained through several basic procedures which may be outlined briefly as follows:

All absences due to illness in each of the three schools are investigated by the school nurse. Upon notification of a communicable disease in the school population, confirmation of the diagnosis is obtained from the private physician, school physician, or other reliable observer. For the purposes of the present study, the establishment of a diagnosis of measles is followed by an attempt to determine the exact date of onset. The period of infectiousness has been arbitrarily considered to extend from 48 hours before the initial symptoms to 9 days afterward, which in the average case means 5 days before onset of the rash and 5 days afterward. On the basis of these limits it is ascertained which children in the classroom and on the school bus were exposed to the primary case. For the determination of secondary cases the incubation period (that is, from exposure to onset of symptoms) has been arbitrarily set from 7 to 15 days.

In each case an earnest effort is made to determine the source of infection, whether it be in the classroom, on the bus, in the home environment, or elsewhere. In the last circumstance, however, only readily detectable sources are explored, such as extra-school playmates, Sunday school classes, and children's parties.

These historical and epidemiological details are recorded on four separate

forms. Each bus driver maintains a daily record, similar to the teacher's class register, which notes which children rode each of the two daily trips. The school nurse fills out a detailed individual history form for each case with information as to onset of symptoms, clinical characteristics, and contacts. The field epidemiologist and statistician, working with the above information and the class registers, draw up continuous daily records of attendance for each class and each bus from 48 hours prior to the onset of the first case in the specific class or bus to 15 days after the last known infection within the group.

In addition, detailed daily records are kept by the school custodians as to the operation of the ventilating systems, indoor and outdoor temperature variations, relative humidity, and similar information. Furthermore, regular monthly air samples have been obtained for bacteriological analysis from representative classrooms in all three schools, employing both the open plate method and the Wells air centrifuge. These bacteriological data, however, will not be covered in this report.

## RESULTS

### *Overall Morbidity*

Since nothing was done to control the spread of infection in the school buses and since there seemed every reason to believe that school buses are as important environments for the spread of measles as classrooms, if not more so, it was not anticipated that there would be any overall reduction in morbidity. If the ultra-violet lamps proved to be of any value in reducing the spread of the infection within the classroom it was felt this would be manifested by changes in the pattern of the cases on a chronological basis rather than in variations in the percentage of susceptible children ultimately developing measles in the irradiated classrooms as compared

TABLE 1  
Per cent of Total Cases Occurring in the First Six Grades

School	Enrollment *		Number of Cases		Per cent of Cases
	Total	Kindergarten through Grade 6	Total	Kindergarten through Grade 6	Kindergarten through Grade 6
Cato-Meridian	618	367	144	132	91.7
Port Byron	846	530	220	209	95.0
Mexico	904	492	146	134	91.8
Total	2,368	1,389	510	475	93.1

\* Exclusive of children enrolled for less than 30 days.

with the non-irradiated classrooms.

In the course of the outbreak 510 cases occurred among the 2,368 pupils enrolled in the three schools (Table 1). Of the 510 cases, 475, or 93 per cent, occurred among children in the kindergarten and first six grades. Subsequent analyses will be confined to these grades, as the number of cases occurring in each of the higher grades is too small to give statistically significant figures. The analyses are limited to the lower grades also because histories as to a prior attack of measles were less accurate in the upper grades, and because ultraviolet lights were installed only through the 8th grade in the Port Byron school. This limitation was dictated by the fact that beyond the 8th grade the pupils do not remain in one room throughout the school day but circulate from one room to another according to the subject they pursue at a given class hour.

Before considering attack rates, it is

of interest to compare the variation in susceptibility by grade in the three schools, as determined by a history of no prior attack of measles. Table 2 shows that the three schools were roughly comparable as to susceptibility to measles at the start of the epidemic, although Mexico quite consistently had somewhat lower percentages of susceptible children at the various grades.

In Table 3 the percentage of the susceptible children who developed measles is indicated for each grade in each school. It will be noted that there is no consistent difference between the three schools, with 78 per cent, 84 per cent, and 69 per cent, respectively, of the children in these grades of the Cato-Meridian, Port Byron, and Mexico schools developing the disease.

This lack of significant variation in total attack rates in the irradiated and non-irradiated classrooms may be indicated further by splitting the Port

TABLE 2  
Per cent of Pupils Susceptible to Measles as of Start of Epidemic \*

Grade	Enrollment			Susceptibles			Per cent of Total		
	Cato-Meridian	Port Byron	Mexico	Cato-Meridian	Port Byron	Mexico	Cato-Meridian	Port Byron	Mexico
Kg.	54	70	55	45	57	33	83.3	81.4	60.0
1	42	85	85	20	58	54	47.6	68.2	63.5
2	58	81	74	32	42	34	55.2	51.9	45.9
3	61	74	72	30	35	25	49.2	47.3	34.7
4	55	76	72	19	27	19	34.5	35.5	26.4
5	51	83	58	12	19	14	23.5	22.9	24.1
6	46	61	76	12	11	14	26.1	18.0	18.4
Total	367	530	492	170	249	193	46.3	47.0	39.2

\* Start of epidemic here means start of epidemic in each grade. Children who entered after start of epidemic are classified according to status they had at time of entrance.

TABLE 3

*Per cent of Susceptible Children Who Developed Measles, by Grade*

Grade	Susceptibles			Measles Cases			Cases per 100 Susceptibles		
	Cato-Meridian	Port Byron	Mexico	Cato-Meridian	Port Byron	Mexico	Cato-Meridian	Port Byron	Mexico
Kg.	45	57	33	39	57	30	86.7	100.0	90.9
1	20	58	54	15	53	43	75.0	91.4	79.6
2	33 *	42	34	24	35	27	72.7	83.3	79.4
3	30	35	25	24	27	15	80.0	77.1	60.0
4	19	34	19	15	20	11	78.9	58.8	57.9
5	12	25	14	7	14	4	58.3	56.0	28.6
6	12	11	14	8	8	4	75.0	72.7	28.6
Total	170	249 †	193	132	209 ‡	134	77.6	83.9	69.4

\* One child exposed in both classrooms of this grade.

† Thirteen children not included in this total were exposed in two classrooms and are counted in both.

‡ Five children not included in this total were exposed in two classrooms and are counted in both.

Byron grades into irradiated and non-irradiated sections (Table 4). Because of the small numbers, rather marked fluctuations in percentages occur but it is evident that there is no significant difference in the attack rate among susceptible children in the irradiated rooms compared with those non-irradiated. Combining the first six grades for each section 82 per cent of the susceptibles in the unirradiated sections acquired measles compared with 86 per cent of those in the irradiated sections.

At this point one might consider the desirability of a more refined analysis in the calculation of measles attack rates, taking into consideration not only the susceptible children in individual classrooms but the volume of air and

the air change. Such a complex analysis is hardly indicated, however, in view of the apparent uniformity of ventilation in the various classrooms, the essential uniformity in the number of susceptibles per room for a given grade, and the uniform size of the classrooms. Of the 43 rooms represented in the first six grades of the three schools, the range in cubic content varies from only 7,400 to 8,700 cu. ft. in 40 of them. Twenty-five of these 40 rooms, in fact, are exactly the same size (8,448 cu. ft.). The remaining three rooms are of the following capacity: 6,870 cu. ft. (Kindergarten B in Mexico); 11,352 cu. ft. (Kindergarten A in Port Byron); 11,880 cu. ft. (Kindergarten B in Cato-Meridian).

TABLE 4

*Port Byron School: Per cent of Susceptible Children Who Developed Measles in Irradiated Rooms Compared with Those in Unirradiated Rooms*

Grade	Susceptibles		Measles Cases		Cases per 100 Susceptibles	
	Unirradiated	Irradiated	Unirradiated	Irradiated	Unirradiated	Irradiated
Kg.	29	28	29	28	100.0	100.0
1	19	39	18	35	94.7	89.7
2	22	20	18	17	81.8	85.0
3	16	19	11	16	68.8	84.2
4	14	20	8	12	57.1	60.0
5	12	13	7	7	58.3	53.8
6	9	2	7	1	77.8	50.0
Total	119 *	130 †	97 ‡	112 **	81.5	86.2

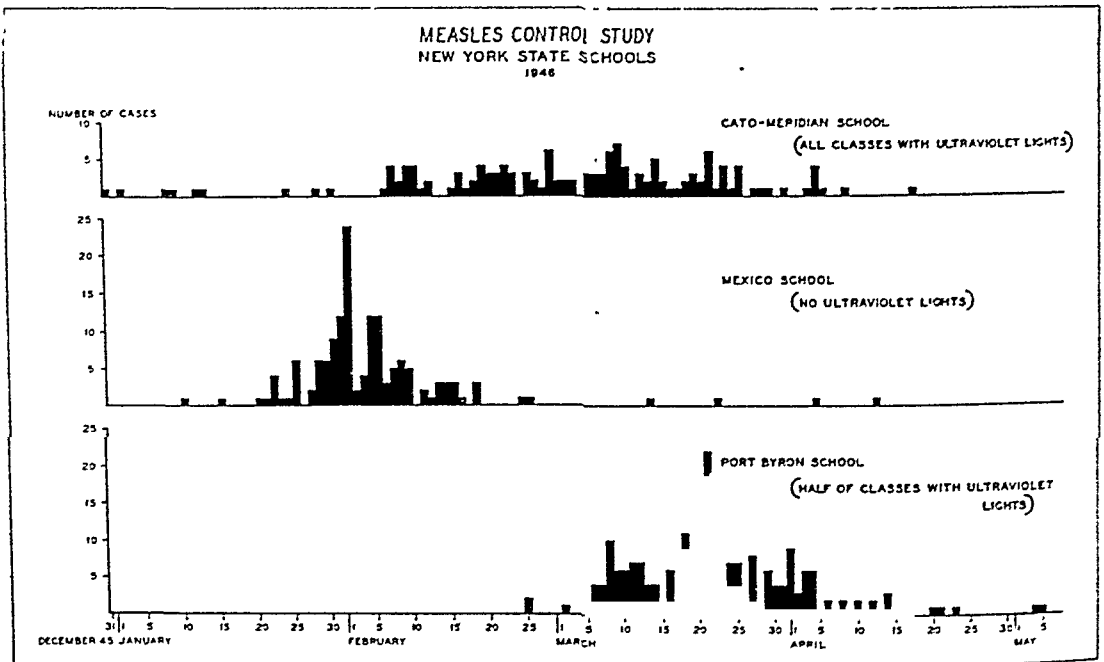
\* Two children not included in this total were exposed in two classrooms and are counted in both.

† Eleven children not included in this total were exposed in two classrooms and are counted in both.

‡ One child not included in this total was exposed in two classrooms and is counted in both.

\*\* Four children not included in this total were exposed in two classrooms and are counted in both.

CHART 1



### *Chronological Pattern*

When one looks at the pattern formed in each school by cases by date of onset a definite difference is noted in the three patterns, as shown in Chart 1. From this chart it is immediately evident that the Cato-Meridian school experienced an extended outbreak with cases dribbling along from December 31, 1945, to April 17, 1946. In contrast, the Mexico school experienced a sharply explosive outbreak about the first of February. Between these two patterns lies the pattern for Port Byron with an outbreak less explosive than that in Mexico but not so protracted as that experienced in Cato-Meridian.

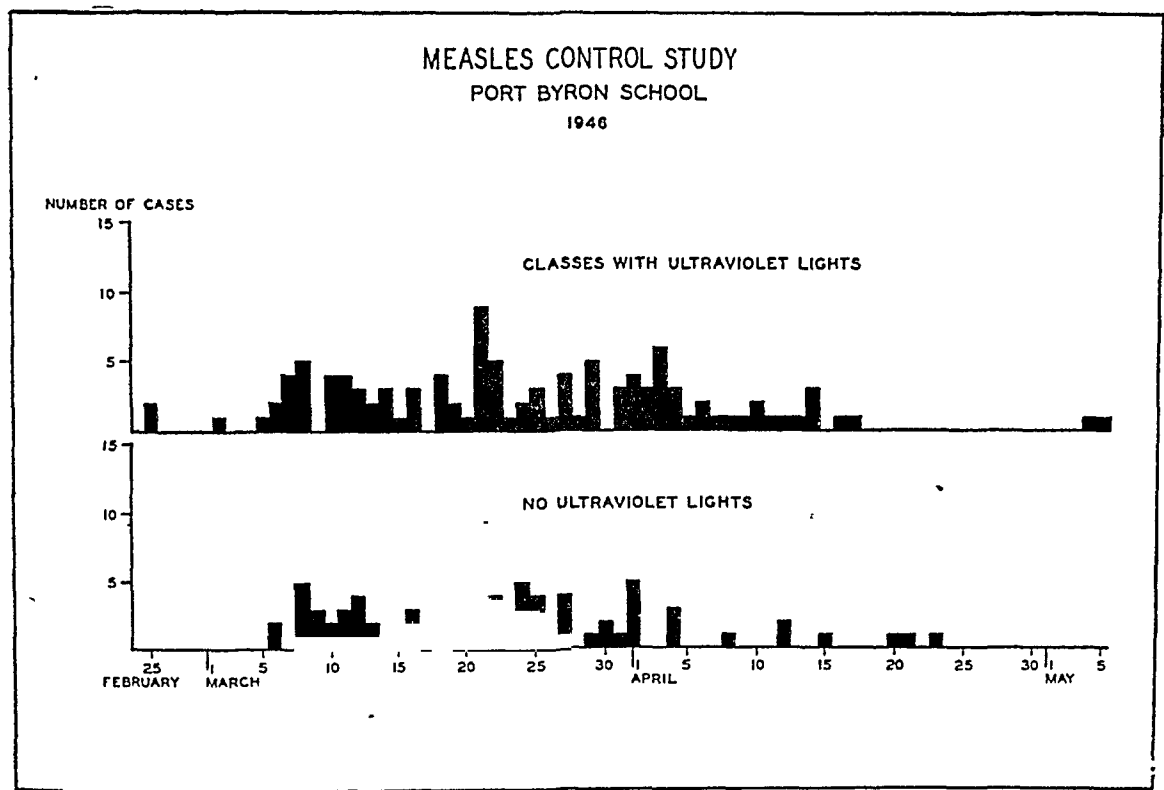
These variations in pattern correspond to the relative degree of irradiation of the three schools, since Cato-Meridian school was completely equipped with lights, Mexico school had none, and in the Port Byron school half of the sections of the lower eight grades were irradiated while the corresponding halves of the same grades were not.

In an attempt to determine whether these variations in pattern are actually

due to the ultra-violet lights a number of analyses were made. If one separates the cases in the Port Byron school according to whether they occurred among children in irradiated or non-irradiated classrooms, another distinct difference in patterns results, as shown in Chart 2. It is evident from this chart that the cases occurring in classes with ultra-violet lights were spread out over a longer period of time than the cases which occurred in the classrooms without ultra-violet lights. Since these classes otherwise apparently were comparable, it is difficult to ascribe these differences in pattern to anything other than to the presence or absence of the lights.

The variations in explosiveness of cases in the irradiated classrooms versus non-irradiated classrooms may be measured by calculating the interval in days covered by the dates of onset for the middle 80 per cent of the total number of cases; that is, 40 per cent of the cases above and 40 per cent below the median case. For the combined grades, the intervals for the unirradiated

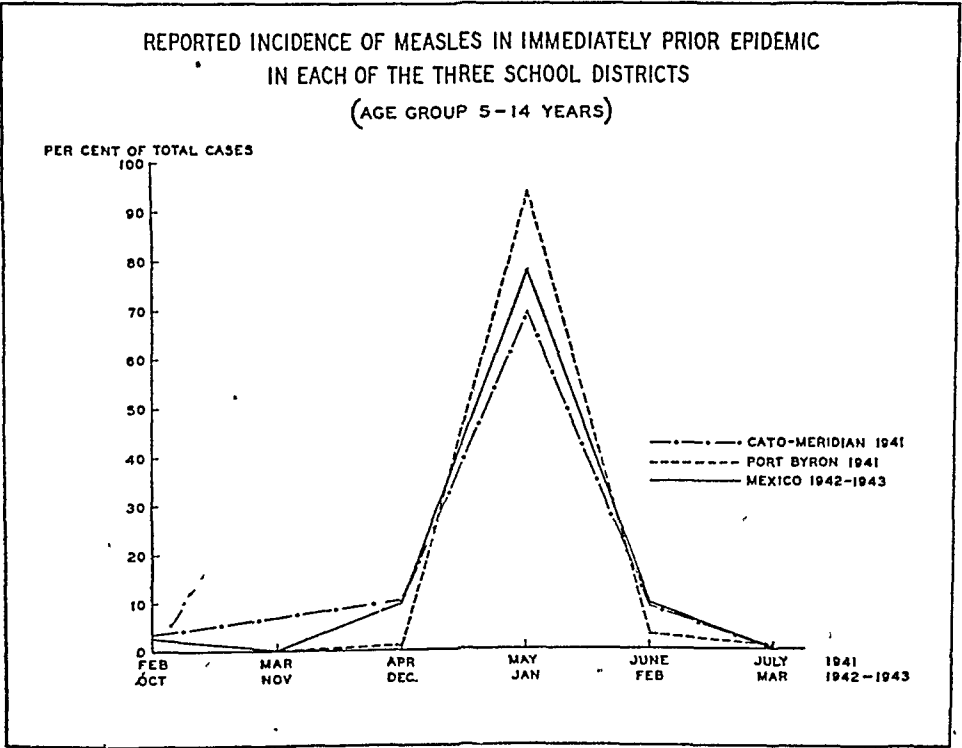
CHART 2



classrooms in the Mexico and Port Byron schools were 15 and 17 days respectively, and for the irradiated classrooms in Port Byron and Cato-Meridian schools, the intervals were 24 and 26 days, respectively.

Returning to a consideration of the contrast between the protracted smoul-

CHART 3



dering outbreak in the Cato-Meridian school and the patterns for the Mexico and Port Byron schools, it would be pertinent to determine what variation in pattern occurred in these three schools in the last previous outbreak of measles in each. Unfortunately, the school health records are such that it is impossible to settle this point from them. However, it is possible to estimate the picture from reports received in the State Department of Health of cases in the 5 to 14 year age group for the townships served by these school districts for the year in which the last previous measles epidemic occurred (1941 for Cato-Meridian and Port Byron school districts, and 1942-1943 for the Mexico school district).

Such cases of measles reported by months in these years would necessarily seem to reflect the pattern in the schools themselves. The patterns of total cases are indicated in Chart 3. From the per cent of total cases reported in each month it will be noted that the outbreaks were very explosive in all three school districts, in marked contrast with the variations in patterns for the three schools in 1946.

#### *School Rooms Versus Buses in the Spread of Measles*

It may be assumed that the differences in the chronological pattern of measles incidence in the three experimental schools were due, in part at least, to the presence or absence of ultra-violet irradiation in the classrooms of those schools. If the school buses were an important factor in the spread

of the disease and contributed significantly to the equalization of the total attack rates, the data should show this.

Any attempt to analyze the data in relation to bus operation is made difficult through numerous uncontrollable factors. The most obvious of these, the fact that practices with regard to bus operation vary markedly from school to school, makes comparisons between the three schools hazardous, and doubtless other variables are equally important. However, all such factors would seem to be unimportant as they relate to the children in one particular school. Thus it is possible to make what should be valid comparisons between attack rates in children in irradiated and unirradiated classrooms of the Port Byron school according to whether they did or did not ride buses. These rates for the kindergarten and first six grades are presented in Table 5.

It will be noted that the attack rates among the bus-riding and non-bus-riding susceptibles in unirradiated classrooms was essentially the same, 83 per cent and 77 per cent respectively. In contrast to this the attack rate of 90 per cent in bus-riding susceptibles of the same grades in irradiated classrooms is significantly greater than that of 69 per cent among the irradiated non-bus riders. The school bus, therefore, did appear to play a somewhat greater role in the dissemination of measles among children in irradiated classrooms than among those not irradiated.

The relatively high attack rate of 69 per cent among non-bus riders attending irradiated classrooms is interesting,

TABLE 5

*Measles Attack Rates among Bus Riders and Non-bus Riders of Port Byron School Kindergarten through Sixth Grades*

	Unirradiated Classrooms			Irradiated Classrooms		
	Susceptibles	Cases	Attack Rate per 100	Susceptibles	Cases	Attack Rate per 100
Bus riders	83	73	83.0	101	94	90.4
Non-bus riders	31	24	77.4	26	18	69.2

but not surprising when note is made of the fact that these were children living in the village. Presumably they had greater opportunity for extra-school contact with other children than bus riders who live for the most part on outlying farms, and this extra-school contact could have been an important contributory factor to the incidence in this non-riding irradiated group.

#### CONCLUSIONS

These analyses of the occurrence of measles in three centralized rural schools seem to indicate that ultra-violet lights in the classrooms did modify the spread of measles in those classrooms. It is not to be construed, however, that upon the basis of these findings, the authors are recommending routine installation of ultra-violet lamps in classrooms.

Further experimental investigation is needed, and the department intends to

continue its studies, observing the effects on other communicable diseases, particularly chickenpox and mumps. In accordance with original plans, the study is to be modified by the installation of triethylene glycol vaporizers in the school buses.

**ACKNOWLEDGMENTS**—The excellent coöperation of the entire school personnel of all three schools and the facilities of the Syracuse Department of Health Bureau of Laboratories under the direction of Dr. O. D. Chapman are gratefully acknowledged.

#### REFERENCES

1. Wells, W. F., Wells, M. W., and Wilder, T. S. The Environmental Control of Epidemic Contagion. I. An Epidemiological Study of Radiant Disinfection of Air in Day Schools. *Am. J. Hyg.*, 35:97 (Jan.), 1942.
2. Wells, W. F., and Wells, M. W. Dynamics of Air-Borne Infection. *Am. J. M. Sc.*, 206:11 (July), 1943.
3. Wells, W. F. Air Disinfection in Day Schools. *A.J.P.H.*, 33:1436 (Dec.), 1943.
4. Wells, Mildred Weeks. Ventilation in the Spread of Chickenpox and Measles Within School Rooms. *J.A.M.A.*, 129:197 (Sept. 15), 1945.

---

## Purchase of Federal Surplus Property

The National Institute of Governmental Purchasing (730 Jackson Place, N.W., Washington, D. C.) calls attention to the abandonment of priorities in purchasing federal surplus property that is threatened by the recent decontrol of prices. It has sent an official statement of policy to every member of Congress and other public officials and businessmen in which it deplores the

hardships already put in the way of state and local governments in their attempts to buy surplus properties. Price decontrols increase these hardships. The statement calls upon the Surplus Property Administrator to appoint an advisory committee of state and local purchasing officials to plan a constructive program for making surplus available to tax supported agencies.



# Use of Census Tracts in the Analysis of City Health Problems\*

HOWARD WHIPPLE GREEN, F.A.P.H.A.

*Secretary, Cleveland Health Council, Cleveland, Ohio*

ALL cities of 250,000 inhabitants or more at the time of the 1940 Census except San Antonio, Tex., and 24 cities with fewer than 250,000 population were laid out in census tracts prior to the 1940 Census.

The Bureau of the Census, following the 1940 Census, published a series of bulletins entitled "Population and Housing: Statistics for Census Tracts," one for each of the 60 census tract cities. With such basic data the tabulation of births, deaths, and cases of reportable diseases by census tract of residence, takes on special significance.

It is common procedure to analyze deaths by age, sex, and cause of death by states. It is also common procedure to calculate infant mortality rates and death rates by counties and large cities within a state, but only recently have infant mortality rates and death rates by cause been analyzed for small sections within large cities. And even more recently have studies been made of the variations by economic tenths within large communities.

The Cleveland five-city area—Cleveland, Lakewood, Cleveland Heights, East Cleveland, and Shaker Heights—has, for statistical purposes, been broken down into 10 economic tenths. The 257 census tracts have been arranged in array by rent of tenant-occupied

homes and rent equivalent of owner-occupied homes. Sufficient census tracts have been accumulated from the lower end of the array to make up one-tenth of all families. This area is called the lowest economic tenth. The process is repeated to obtain the second, and so forth. Those remaining make up the highest economic tenth.

The map shows the census tracts included in each of the 10 economic tenths of the Cleveland five-city area. There are somewhat more than 29,000 families with 100,000 men, women, and children in each economic tenth.

The possession of radios in 1930, automobiles and mechanical refrigeration in 1934, telephones in 1937, radios, mechanical refrigeration, tubs or shower baths, and central heating in 1940 varies by economic tenths. The 1940 level of education also varies by these economic tenths.

More than half, 53 per cent, of the families in the Cleveland five-city area had radios in April, 1930. The percentage of families with radios varied from 23 per cent of those in the lowest economic tenth to 80 per cent of those in the highest economic tenth.

While the same percentage of the families in the Cleveland five-city area had automobiles in January, 1934, the percentage varied from 24 per cent of those in the lowest economic tenth to 86 per cent of those in the highest.

Nearly a fifth, 19 per cent, of the families in the Cleveland five-city area

\* Presented before the Vital Statistics Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 14, 1946

TABLE 1

*Percentage of Families with Various Possessions by Economic Tenths  
Cleveland Five-city Area*

<i>Economic Tenth</i>	<i>Radios</i>	<i>Automobiles</i>	<i>Mechanical Refrigeration</i>	<i>Telephones</i>
	<i>1930</i>	<i>1934</i>	<i>1934</i>	<i>1937</i>
Total	53.3	53.2	19.3	38.0
Lowest	22.6	23.6	1.4	8.0
2	29.3	28.2	2.1	10.9
3	39.1	36.8	4.5	18.7
4	47.2	44.7	6.3	22.2
5	51.3	54.6	9.1	29.7
6	62.4	59.0	13.0	36.0
7	62.9	61.7	15.5	42.2
8	67.5	64.2	27.5	52.6
9	71.6	68.3	49.1	64.7
Highest	80.2	85.6	61.2	88.0

had mechanical refrigeration in January, 1934, 1 per cent of the families in the lowest economic tenth and 61 per cent of those in the highest economic tenth.

While 38 per cent of the families in the Cleveland five-city area had telephones in May, 1937, 8 per cent of those in the lowest economic tenth had telephones and 88 per cent of those in the highest economic tenth.

Table 1 shows the figures for each economic tenth.

Ninety-six per cent of the families in the Cleveland five-city area had radios in April, 1940, 87 per cent of those in the lowest economic tenth and 99 per cent in the highest economic tenth.

Fifty-six per cent of the families in the Cleveland five-city area had me-

chanical refrigeration in April, 1940, 18 per cent of those in the lowest economic tenth and 91 per cent of those in the highest economic tenth.

Ninety-two per cent of the families in the Cleveland five-city area had tubs and shower baths in April, 1940, 68 per cent of those in the lowest economic tenth and 100 per cent of those in the highest economic tenth.

Seventy-eight per cent of the families in the Cleveland five-city area had central heating in April, 1940, 22 per cent of those in the lowest economic tenth and 99 per cent of those in the highest economic tenth.

The median number of years of school completed by persons 25 years of age and over was 8.7 for the entire Cleveland five-city area in April, 1940, less

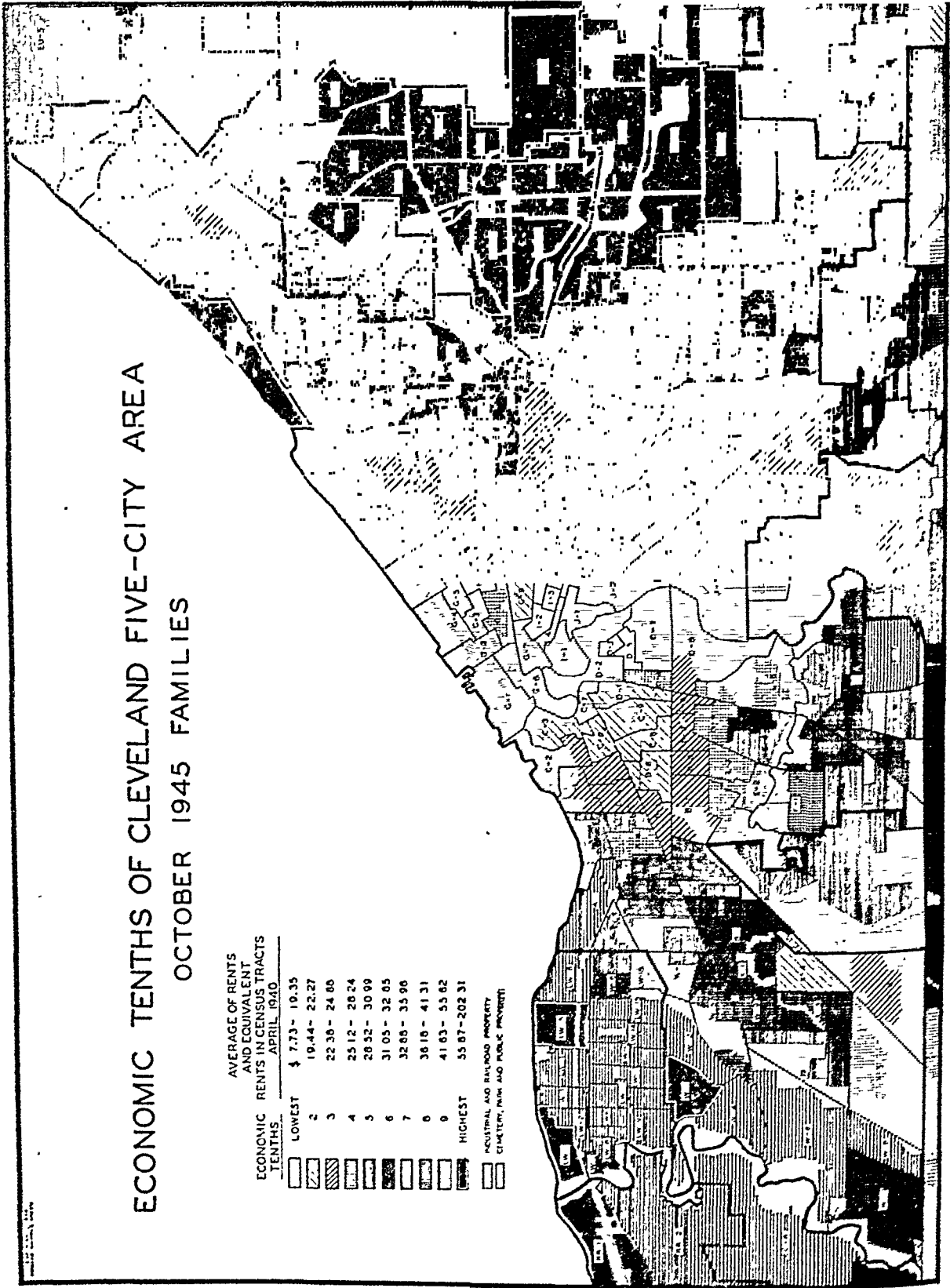
TABLE 2

*Percentage of Families with Various Possessions by Economic Tenths  
Cleveland Five-city Area: 1940*

<i>Economic Tenth</i>	<i>Radios</i>	<i>Mechanical Refrigeration</i>	<i>Tubs or Shower Baths</i>	<i>Central Heating</i>	<i>Median Years of School</i>
Total	96.0	55.9	91.6	78.3	8.7
Lowest	86.9	18.4	68.4	21.5	6.9
2	91.7	31.3	78.5	48.2	7.7
3	94.5	38.4	87.6	64.0	8.0
4	95.9	46.0	93.7	75.5	8.1
5	97.3	52.5	94.7	91.6	8.4
6	98.2	61.7	96.9	92.4	8.6
7	98.5	65.2	98.5	94.6	8.6
8	98.8	73.1	98.2	97.2	9.8
9	98.9	81.1	99.2	97.1	11.8
Highest	99.4	91.2	99.8	99.4	12.4

ECONOMIC TENTHS OF CLEVELAND FIVE-CITY AREA  
OCTOBER 1945 FAMILIES

AVERAGE OF RENTS AND EQUIVALENT RENTS IN CENSUS TRACTS TENTHS		APRIL 1940	
LOWEST	1	7.73 - 10.35	
2	2	10.44 - 22.27	
3	3	22.30 - 24.85	
4	4	25.12 - 28.24	
5	5	28.32 - 30.99	
6	6	31.05 - 32.85	
7	7	32.88 - 35.96	
8	8	36.10 - 41.31	
9	9	41.03 - 55.62	
HIGHEST	10	55.87 - 202.31	
INDUSTRIAL AND RAILROAD PROPERTY			
CITY, STATE, RAIL AND PUBLIC PROPERTY			



than 7 years in the lowest economic tenth and more than 12 years in the highest economic tenth.

Table 2 shows the figures for each economic tenth.

The percentage of births in hospitals or deliveries by midwives in 1919 varied by economic tenths. Less than a fifth, 19 per cent, of the births in the Cleveland five-city area were in hospitals in 1919, 5 per cent of those in the lowest economic tenth and 53 per cent of those in the highest economic tenth.

More than three-quarters, 76 per cent, of the births in the Cleveland five-city area were in hospitals in 1937, 59 per cent of those in the lowest economic tenth and 98 per cent of those in the highest economic tenth.

Nearly one-third, or 32 per cent, of the births in the Cleveland five-city area were delivered by midwives in 1919, 62 per cent of those in the lowest economic tenth and 5 per cent of those in the highest economic tenth.

In 1937 only 1 per cent of the births were delivered by midwives.

Infant mortality rates varied greatly by economic tenths in 1919.

The white infant mortality rate for the Cleveland five-city area in 1919 was 83. It varied from 116 in the lowest economic tenth to 45 in the highest economic tenth.

The white infant mortality rate for the Cleveland five-city area in 1937 was 40. It varied from 52 in the lowest economic tenth to 32 in the highest economic tenth.

Only slight variations by economic tenths were indicated for those under 1 month of age.

The variation of deaths of infants in the last 11 months of the first year of life per 1,000 live births in 1919 was spectacular and still great in 1937 even though the infant mortality rate was much lower.

The number of white infant deaths 1 month to 1 year per 1,000 live births in the Cleveland five-city area in 1919 amounted to 48. It varied from 78 in the lowest economic tenth to 16 in the highest economic tenth.

The number of white infant deaths 1 month to 1 year per 1,000 live births for the Cleveland five-city area in 1937 amounted to 13. It varied from 26 in the lowest economic tenth to 5 in the highest economic tenth.

Table 3 shows these data for each economic tenth.

Cases of tuberculosis varied tremendously by economic tenths in 1930, and the variations were still great in 1940. In May, 1940, there were 5,767 cases of tuberculosis on record in the Cleveland five-city area, 924 in the lowest

TABLE 3

*Percentage of Births Delivered in Hospitals and by Midwives in the Home, and Infant Mortality Rates (White) by Economic Status  
Cleveland Five-city Area*

Economic Tenth	Percentage of Births Delivered				Infant Mortality Rates—White					
	In Hospitals		By Midwives		Under 1 Yr.		1 Mo. to 1 Yr.		Under 1 Mo.	
	1919	1937	1919	1937	1919	1937	1919	1937	1919	1937
	1919	1937	1919	1937	1919	1937	1919	1937	1919	1937
Total	18.8	76.2	31.6	1.1	83.5	40.0	47.7	12.9	35.8	27.1
Lowest	5.1	58.7	61.7	3.9	115.7	51.8	78.0	25.6	37.7	26.2
2	14.2	59.4	36.9	1.7	97.5	52.6	57.3	21.3	40.2	31.3
3	15.1	68.4	29.5	0.9	82.2	44.4	41.8	14.6	40.4	29.8
4	17.8	73.0	22.7	1.8	67.5	38.0	38.7	10.4	28.8	27.6
5	21.5	75.9	22.4	1.1	66.2	33.1	34.4	8.6	31.8	24.5
6	20.9	81.5	10.5	0.1	66.0	38.3	32.4	9.6	33.6	28.7
7	35.4	85.8	6.3	0.3	59.9	36.2	27.0	12.3	32.9	23.9
8	45.2	89.0	3.7	0.1	49.4	33.9	19.8	9.8	29.6	24.1
9	49.4	92.6	2.7	0.6	51.4	38.4	13.8	9.8	37.6	28.6
Highest	53.3	97.7	4.9	..	45.5	31.8	15.8	5.3	29.7	26.5

TABLE 4

*Cases of Tuberculosis by Economic Tenths  
Cleveland Five-city Area*

<i>Economic Tenth</i>	<i>Cases of Tuberculosis White May, 1940</i>	<i>New Cases of Tuberculosis Discovered in Case Finding Clinics, 1945</i>	<i>Cases of Tuberculosis Admitted to Sanatoria 1945</i>
Total	5,767	761	894
Lowest	924	192	235
2	1,043	105	152
3	885	100	127
4	760	84	83
5	521	64	69
6	426	62	68
7	439	47	60
8	334	45	46
9	269	29	27
Highest	166	33	27

economic tenth and 166 in the highest economic tenth.

The death rate from tuberculosis for Negroes varied between economic tenths in a manner similar to that for the white population. It was five times as high as the white rate in each economic tenth where there were enough Negroes to make such a comparison valid.

The number of new cases of tuberculosis discovered in case finding clinics in 1945 in the Cleveland five-city area totaled 761, and varied from 192 in the lowest economic tenth to 33 in the highest economic tenth.

A total of 894 cases were admitted to Sunny Acres Sanatorium and Lowman Pavilion of City Hospital in 1945, varying from 235 in the lowest economic tenth to 27 in the highest economic tenth.

Public health workers for years have recognized that with infant mortality rates varying greatly between states, the chance of causing reductions in the rates for the country was good. They also recognized that since infant mortality rates varied greatly between counties within a state, the chances of causing reductions in the state were good.

The county in which Cleveland is located has a population larger than any one of 17 states or the District of Columbia and larger than 4 entire states taken together. Therefore, the variations in rates within such a county may well be studied.

I have shown you that certain mortality and morbidity rates vary greatly between sections of the Cleveland community, and therefore the chances of successfully causing further reductions in the rates for the entire community are good.

Such analyses make it possible to concentrate public health activities in areas with high rates. Such analyses make it possible for the health officer to use a rifle rather than scattering his fire with a shotgun.

## BIBLIOGRAPHY

- Bureau of the Census. *Population and Housing: Statistics for Census Tracts, Cleveland, Ohio, and Adjacent Area*, 1942.
- Green, Howard Whipple: *Cases of Tuberculosis in Cuyahoga County*. Sheet-A-Week VII, 37 (June 6), 1940.
- Census Tract Street Index for Cleveland Metropolitan District and Cuyahoga County*. 4th ed. Cleveland Health Council, 1944.
- Dispensary Patients and Economic Status, Greater Cleveland, 1935*. Cleveland Health Council, 1936.
- Economic Tenths of October, 1945*. Sheet-A-Week XIII, 34 (May 9), 1946.
- Hospital Patients and Economic Status, Greater Cleveland, 1936*. Cleveland Health Council, 1938.
- Infant Mortality and Economic Status, Cleveland Five-City Area, 1919-1937*. Cleveland Health Council, 1939.
- Natural Increase and Migration, Greater Cleveland, 1919-1937*. Cleveland Health Council, 1938.
- Planes of Living in Cuyahoga County. Real Property Inventory of Metropolitan Cleveland, 1940*. 2 vols.
- Population Characteristics by Census Tracts, Cleveland, Ohio, 1930*. Plain Dealer Publishing Company, 1931.
- Standards of Living in the Cleveland Metropolitan District. Real Property Inventory of Metropolitan Cleveland, 1935*.
- Tuberculosis and Economic Strata, Cleveland's Five-City Area, 1928-1931*. Cleveland Health Council, 1932.
- Kramer, Morton. *Tuberculosis Statistician for Cuyahoga County, Ohio*. Cuyahoga County Tuberculosis Clinic. 1945.

# The Correlation of Laboratory and Clinical Evidence of Virulence of *C. diphtheriae*\*†

MARTIN FROBISHER, JR., Sc.D., F.A.P.H.A.,  
ELIZABETH I. PARSONS, Sc.D., AND ELAINE UPDYKE, Sc.D.

*Department of Bacteriology, Johns Hopkins University, School of Hygiene and Public Health, Baltimore, Md.*

SINCE the work of Loeffler, and of Roux and Yersin about 1890, it has been generally accepted that strains of *Corynebacterium diphtheriae* which produce soluble exotoxin are capable of producing diphtheria in susceptible human beings. There seems no reason at present to alter our view on this point.

With respect to strains which do *not* produce soluble exotoxin, it was first recognized by Loeffler that certain cultures of *C. diphtheriae* obtained from normal persons are not "virulent" as judged by tests in rabbits or guinea pigs. While some of Loeffler's non-virulent strains were doubtless what we now call diphtheroids, i.e., *Corynebacterium xerose* and *Corynebacterium pseudodiphthericum* (Hoffman's bacillus), it has been repeatedly confirmed that there are many strains of *C. diphtheriae* which are entirely avirulent (i.e., non-toxicogenic) as tested in animals, but otherwise absolutely indistinguishable from virulent (i.e., toxicogenic) *C. diphtheriae*, either morphologically

or on any known cultural or biochemical basis.‡ After the classical studies on diphtheria by Roux and Yersin, it was assumed, and at the time justifiably so, that these non-toxicogenic strains could not cause clinical diphtheria.

However, within the last two decades, from time to time, here and there, doubt has been expressed as to the absolute soundness of the time-tested doctrine that strains of *C. diphtheriae* which give a positive virulence test in animals can cause diphtheria, while those giving a negative virulence test cannot cause diphtheria. In 1922 Jordan, Smith, and Kingsbury<sup>1</sup> stated, on the basis of a careful comparative study, that pathogenicity of diphtheria bacilli for human beings and for guinea pigs are not absolutely parallel. A little later Doull<sup>2</sup> brought the value of the animal virulence test as a clinical method into question on a statistical basis. In evaluating the danger, to a susceptible person, of exposure to cases, contacts of cases, casual healthy virulent carriers, carriers of avirulent organisms, and the general population, he found a definite

\* Presented before a Joint Session of the Health Officers, Epidemiology, and Laboratory Sections of the American Public Health Association at the seventy-fourth Annual Meeting in Cleveland, Ohio, November 11, 1946.

† The studies on immunity and endotoxin referred to in this paper were carried on with financial assistance from the International Health Division of The Rockefeller Foundation.

‡ The terms virulent and avirulent (or non-virulent) as used here, refer to production or non-production of a soluble exotoxin demonstrable in sterile filtrates of broth cultures of such organisms.

and unexpected excess of cases among contacts of carriers of avirulent strains. This could be explained only on the basis that: (a) the bacteriologist was in error or, (b) that the virulence test in animals failed to reveal fully all the pathogenic potentialities of all strains of *C. diphtheriae*, including possible change of avirulent to virulent and reverse. The first explanation (a) appears to have been generally accepted. At any rate, no further attention was given to the matter on an experimental basis.

The possibility cannot be denied that virulent organisms may completely lose their virulence. The change appears to be rare, and if it occurs, is nearly always accompanied by such profound alterations in morphological and biochemical properties as to suggest contamination or at least to render impossible identification of the strain if its source is not stated. Changes of this sort have been reported by Crowell,<sup>3</sup> Cowan,<sup>4</sup> and Maver.<sup>5</sup> Morton<sup>6</sup> reported more convincing changes. The epidemiological studies by Dudley, *et al.*,<sup>7</sup> in 1934, present merely circumstantial evidence for loss of virulence, which is far from convincing.

On the other hand, extensive investigation by Ramon, Débre and Gilbrin<sup>8</sup> in Paris, by Okell,<sup>9</sup> Okell and Parish,<sup>10</sup> and Dudley,<sup>11</sup> in London, by Powell,<sup>12</sup> and by ourselves (unpublished) in Baltimore, have failed to reveal any instance in which virulent strains, while retaining their typical morphological and biochemical properties, have become avirulent. Conversely, avirulent strains, under the same conditions as to identifying characters, have never been proven to acquire the property of toxigenicity. It is of especial interest, therefore, that non-toxicogenic strains of *C. diphtheriae* continue to force themselves upon our attention as possible agents of disease, possessed of some subtle, unexplained, pathogenic power.

#### VIRULENCE OF NON-TOXIGENIC DIPHTHERIA BACILLI FOR MICE AND CHICK EMBRYOS

Light on the question of pathogenic properties of avirulent diphtheria bacilli was first focused from a somewhat oblique angle when it was discovered in 1940<sup>13</sup> that cultures of *C. diphtheriae* absolutely devoid of the power of producing exotoxin, so far as could be determined by the most sensitive tests, would kill mice regularly following intracerebral injection. Direct tests of toxigenicity by subcutaneous injection of large doses of live culture into guinea pigs were entirely negative, and delicate tests in guinea pigs allergic to toxin<sup>14</sup> confirmed the non-toxigenicity of the cultures. Ordinary antitoxin had no protective effect whatever against the intracerebral effects in mice. The extraordinary and highly distinctive signs of cerebral irritation in mice dying of



FIGURE 1—Mice after injection of non-toxicogenic diphtheria bacilli intracerebrally. The animal in the center was moribund. Note the curious position of head and fore part of the body, and the crooked tail; both are distinctive of the endotoxic encephalitis.

such injections have been previously described.<sup>15</sup> Peculiar paralyses and evidences of peripheral neuritis are an outstanding feature (Figure 1).

The effect of the avirulent organisms on mice was first ascribed to irritation due to infection, and probably infection does exist for a time before the mice die, which usually occurs in about 4 to 8 days. However, it has not been possible to carry the infection from brain to brain more than a maximum of four daily or 2-day transfers; usually we could not produce any symptoms in third-passage mice and the organisms died out and could not be recovered in cultures. Smears from the brains showed that the bacteria were actively phagocytized. Whether or not infection (i.e., considerable proliferation of the organisms in the brain) existed, the distinctive signs of cerebral irritation produced by these organisms were not reproducible with other bacteria which also killed mice by intracerebral injection, such as typhoid bacilli and pneumococci, and they were therefore ascribed to the effects of specific endotoxins peculiar to the avirulent diphtheria organisms. Heat-killed or ground-up diphtheria bacilli, virulent or avirulent, had no such effect. Dudley<sup>11</sup> has noted similar endotoxic effects in guinea pigs.

T'ung<sup>16</sup> showed that avirulent strains could invade chick embryos and even induce the formation of histologically typical pseudomembranes on the chorio-allantoic membrane.

It was illuminating to discover also during these studies that sterile, filtered exotoxin from toxigenic strains of *C. diphtheriae* produced an identical clinical picture in mice, but that *it could readily be controlled with antitoxin*.

#### ATOXIGENIC BACILLI AS IMMUNIZING AGENT

Another source of light on the possible significance of endotoxins was kindled in 1936 and 1940 when it was

found in Alabama by Chason<sup>17</sup> and by Gill<sup>18</sup> during studies of the prevalence of carriers of virulent diphtheria bacilli, and the relation of such carrier rates to the Schick test, that 90 to 92 per cent of rural children *under 10 years of age* were Schick-negative while virulent-bacillus carrier rates were under 1 per cent. But it was found in 1940 that about 7 per cent of the children carried avirulent bacilli. Even more striking data of a similar nature were found by Stebbins<sup>19</sup> in Kingston, N. Y.

In attempting an explanation of these findings it was suggested that the role of the widely prevalent avirulent organisms might be that of an immunizing agent.<sup>20-22</sup> While not capable of inducing Schick-negativeness, since that depends on antitoxin, it could increase resistance so that a Schick-negative status could be attained by many children in the population as a result of contact with virulent bacilli with little or no evidence of clinical diphtheria. Without offering any defense of this hypothesis, we nevertheless thought of attempting immunization of rabbits and guinea pigs with suspensions of live, avirulent, non-toxigenic diphtheria organisms and testing the resistance of the animals to live, virulent, toxigenic strains and to sterile toxin.<sup>23</sup> The details of later studies of immunization will be published later.

About 64 per cent of the immunized animals showed definite resistance to sterile toxin, or to an infective dose of live organisms which has never failed to kill control animals, of which several dozen have been used, within 1 to 5 days. This very severe test of resistance greatly exceeds the type of infection encountered in the ordinary course of human contacts. It was used because it was found very difficult to adjust smaller doses so that a reasonably constant lesser percentage of control animals would die. So variable is the resistance of the test animals to border-



TABLE 1  
Resistance of Animals Immunized with Avirulent Diphtheria Bacilli

Animals	Injected	Survived	Significantly Outlived Controls (Beyond 7 Days)	Showed Some Evidence of Resistance
Rabbits	22	8	3	11 (50%)
Guinea pigs	80	39	15	54 (67.5%)
Totals	102	47	18	65 (64%)
Controls (20 rabbits and 25 guinea pigs)	45	0	all died 2-5 days	0

line lethal doses that, to accomplish this, an unduly large number of animals would have to be used in order to obtain a statistically valid result. It is felt, therefore, that the resistance manifested by the immunized animals, even though it may not have saved all of them, was effective to an extraordinary degree. About 20 per cent of the immunized animals survived. These data are summarized in Table 1. Animals tested were found Schick-positive at the end of the period of immunization. In none of them was even so small an amount as 0.001 unit of antitoxin per ml. of serum demonstrable. This absence of antitoxin has been repeatedly and thoroughly confirmed. Indeed, the serum of resistant animals assayed either by skin test or by *in vitro* titration, had no demonstrable specific antibody content whatever except for agglutinins in low titer. Additional details of some of these tests are to be published elsewhere.

#### OCCURRENCE OF NON-TOXIGENIC BACILLI IN CLINICAL DIPHTHERIA

Knowledge stood at this level in 1945 and 1946 when very disturbing results began to be obtained from virulence tests made on cultures obtained from patients in Sydenham Hospital in Baltimore. Cultures were handled, and all tests carried out, in a manner rigidly conforming in all respects to procedures followed during the last 14 years in studying diphtheria bacilli in this laboratory. We have, therefore, no reason to suspect that aberrant results may have been due to irregularities in labo-

ratory technics. Yet there seems no question that repeatedly during the last 2 years, and with increasing frequency, we have isolated from undoubted cases of clinical diphtheria, diphtheria bacilli which are wholly atoxigenic, or totally avirulent, as judged by tests in both rabbits and chicks.<sup>24</sup> These observations are paralleled by findings reported to us from other parts of the United States and observed in other countries where we have studied diphtheria.

#### DISCUSSION

There appears to be no doubt of the validity of the facts observed. As to explanation, we may, as it were, "pleasantly speculate" or, if we wish to flatter our astuteness, "shrewdly guess" on the basis of available facts: (1) We know that avirulent diphtheria bacilli contain an endotoxin. (2) We know that this endotoxin and exotoxin produce identical symptoms in mice, and that both are strongly neurotropic; also there is evidence that avirulent organisms can induce pseudomembrane formation in chick embryos. (3) We know that endotoxin is immunologically related to exotoxin since we can produce resistance to infection or intoxication by one with injections of the other. (4) We know that cases of clinically typical diphtheria occur in which only non-toxicogenic bacilli are found.

On the basis of these facts, we may reasonably hypothesize that endotoxin plays some role in the pathogenesis of some cases of diphtheria. The suggestion is made that it may be a precursor

of exotoxin, just as certain pigments of bacteria or digestive enzymes of other cells are precursors intracellularly of what they become extracellularly. For example pyocyanin, excreted as a leucobase, becomes blue on oxidation, while pepsin first appears as pepsinogen. If this idea be permitted, we may suspect that at least some strains of so-called avirulent diphtheria bacilli liberate considerable amounts of endotoxin as such—perhaps on disintegration due to lytic action of the phagocytic cells or of the serum of the patient. Following the pyocyanin and pepsin analogy, this endotoxin, once liberated, could become activated (possibly oxidized) to something like exotoxin by the tissues with which it combines, resulting in damage to the tissue cells.

We know that ordinary antitoxin has no effect on the endotoxin, at least in mice. It is conceivable that in cases of *endotoxic diphtheria*, if indeed they occur, antitoxin would be of less avail than usual, because it could not affect the endotoxin till it was activated by combination with tissue cells, and then, as is generally known, it would be too late for antitoxin to neutralize it.

Obviously, more clinical investigation is needed in correlation with laboratory studies to determine: (1) whether such cases are more or less refractory to antitoxin; (2) whether the serum or cells of such patients contain lytic bodies for avirulent diphtheria bacilli; (3) whether all so-called avirulent strains are alike in endotoxin content, both qualitatively and quantitatively (we have evidence indicating differences in this respect). (4) Chemical studies on the relation of *endotoxin* and *exotoxin* would be of great interest.

#### IN SUMMARY

We have cited evidence, first, that "virulence tests" of diphtheria bacilli in rabbits, chicks, and guinea pigs (which are merely tests for production

of exotoxin) do not necessarily reveal all pathogenic potentialities of diphtheria bacilli for human beings.

Second, it is clear that so-called avirulent diphtheria bacilli contain endotoxins.

Third, we have evidence that endo- and exotoxins of *C. diphtheria* are immunologically related, but that the endotoxin is not neutralized by anti-exotoxin.

Fourth, in numerous cases of clinically typical diphtheria only non-toxicogenic strains of diphtheria bacilli have been found.

It seems reasonable to conclude that avirulent diphtheria bacilli may be implicated in some way in the production of diphtheria-like disease.

#### REFERENCES

1. Jordan, J. H., Smith, F., and Kingsbury, A. N. A Study of the Relation of Morphological and Cultural Characteristics of the Diphtheria Group of Bacilli to Pathogenicity. *Lancet*, 203:1052, 1922.
2. Doull, J. A. Factors Influencing Selective Distribution in Diphtheria. *J. Prev. Med.*, 4:371, 1930.
3. Crowell, M. J. Morphological and Physiological Variations in the Descendants of a Single Diphtheria Bacillus. *J. Bact.*, 11:65, 1926.
4. Cowan, M. L. The Separation of Virulent Cultures of *B. diphtheriae* into Virulent and Avirulent Types. *Brit. J. Exper. Path.*, 8:6, 1927.
5. Maver, M. E. The Attenuation of the Diphtheria Bacillus in Synthetic Mediums. *J. Infect. Dis.*, 49:9, 1931.
6. Morton, H. E. *Corynebacterium diphtheriae*. A Correlation of Recorded Variations within the Species. *Bact. Rev.*, 4:177, 1940.
7. Dudley, S. F., May, P. M., and O'Flynn, J. A. Active Immunization Against Diphtheria. Med. Res. Council, *Spec. Rep. Ser.*, No. 195, London, 1934.
8. Ramon, G., Dèbre, R., and Gilbrin, E. Etude des Propriétés Biologiques des Bacilles Diphtheriques Prélevés chez des Sujets Malades, au Cours de la Maladies et Pendant la Convalescence, ainsi que chez des Porteurs de Germes Sains. *Compt. rend. Soc. de Biol.*, 116:905 and 909, 1934.
9. Okell, C. C. The Relationship of Virulent to Avirulent Diphtheria Bacilli. *J. Hyg.*, 29:309, 1929.
10. Okell, C. C., and Parish, H. J. The Virulence Testing of the Diphtheria Bacillus and Its Practical Application. *J. Hyg.*, 25:355, 1926.
11. Dudley, S. F. The Virulence of *C. diphtheriae*, Especially of the Atoxic Subspecies. *Brit. J. Exper. Path.*, 6:225, 1925.
12. Powell, H. M. A Biological Study of the Diphtheria Bacillus. I. The Virulence of Pure-line Strains. *Am. J. Hyg.*, 3:109, 1923.
13. Frobisher, M., Jr., and Parsons, E. I. Susceptibility of Mice to Intracerebral Inoculation of *C. diphtheriae* and Diphtheria Toxin. *Proc. Soc. Exper. Biol. & Med.*, 45:165, 1940.
14. Phair, J. Diphtheria Immunization. Secondary Stimulus in Guinea Pigs as a Test of Toxicogenicity of Avirulent *C. diphtheriae*. *Am. J. Hyg.*, 35:386, 1942.

15. Frobisher, M., Jr., and Parsons, E. I. Susceptibility of Mice to Intracerebral Inoculation of *C. diphtheriae* and Diphtheria Toxin. *Proc. Soc. Exper. Biol. & Med.*, 45:165, 1940.

16. T'ung, T. Experimental Production and Chemoprophylaxis of *C. diphtheriae* Infection in the Chick Embryo. *Am. J. Hyg.*, 41:57, 1945.

17. Chason, O. L. Diphtheria in Rural Alabama. *Am. J. Hyg.*, 23:539, 1936.

18. Gill, D. C. Schick Tests and Carrier Surveys in White School Children, Alabama, 1937-1938. *A.J.P.H.*, 30 (March Suppl.):25, 1940.

19. Stebbins, E. L. Diphtheria Immunity and Carrier Surveys in New York State. *A.J.P.H.*, 30 (March Suppl.):36, 1940.

20. Frobisher, M., Jr. Strains of *C. diphtheriae* in Various Parts of the United States. *A.J.P.H.*, 30 (March Suppl.):28, 1940.

21. Frobisher, M., Jr., and Parsons, E. I. The Possible Role of Avirulent Strains of *C. diphtheriae* in the Natural Immunization of Children. *J. Bact.*, 1940, *Scientif. Proc.*, p. 60.

22. Idem. Properties of Strains of *C. diphtheriae* Obtained from Various Parts of the United States. *A.J.P.H.*, 32:709, 1942.

23. Frobisher, M., Jr., and Parsons, E. I. Resistance against Toxigenic *C. diphtheriae* in Rabbits following Injections of Nontoxigenic Diphtheria Bacilli. *Am. J. Hyg.*, 37:53, 1943.

24. Frobisher, M., Jr., Parsons, E. I., and T'ung, T. The Use of Chicks in Testing the Virulence of *Corynebacterium diphtheriae*. *Am. J. Hyg.*, 35:381, 1942.

NOTE: The authors make grateful acknowledgment of valuable assistance in this work by Dr. Shih-en Pai of the National Central University, Chungking, China; Martha Adams and William M. Kuhns; and Dr. Margaret H. D. Smith and Helen Zepp of Sydenham Hospital, Baltimore, as well as kind coöperation of Dr. Huntington Williams, Commissioner of Health of Baltimore.

Best Sellers in the Book Service for April

An Appraisal Method for Measuring the Quality of Housing: A Yardstick for Health Officers, Housing Officials and Planners, Part I. Nature and Uses of the Method. American Public Health Association. 1945.....	\$1.00
The Control of Communicable Diseases. American Public Health Association. 6th ed. 1945 .....	.35
Dairy Bacteriology and Public Health. C. S. Bryan. 1945.....	1.00
Diagnostic Procedures and Reagents. American Public Health Association. 2nd ed. 1945 .....	4.00
Effective Living. C. E. Turner and E. McHose. 2nd ed. 1945.....	2.00
How a Baby Grows. A Story in Pictures. A Gesell. 1945.....	2.00
Modern Attack on Tuberculosis. Chadwick & Pope. 2nd ed. 1946.....	1.00
Proceedings of the National Conference on Local Health Units. September 9-13, 1946, Ann Arbor, Michigan. Supplement to the American Journal of Public Health, January, 1947. Covered.....	1.00
Standard Methods for the Examination of Dairy Products. American Public Health Association. 8th ed. 1941. Paper cover.....	2.00
Swimming Pool Data and Reference Annual. 14th ed. 1946.....	3.00

Order from the Book Service  
AMERICAN PUBLIC HEALTH ASSOCIATION

# Present Recommendations Concerning Treatment and Prophylaxis of Diphtheria\*

FRANKLIN H. TOP, M.D., M.P.H., F.A.P.H.A.

*Medical Director, Herman Kiefer Hospital, Detroit, Mich.*

THERE is at the present time a re-awakened interest in diphtheria, stimulated by a slight rise in case incidence in areas throughout the world where the disease is indigenous and augmented by a disproportionate increase of cases among adults, both civilian and military. The rise in case incidence, however slight, has been viewed with alarm, particularly by health officers, who felt they had in diphtheria immunization a formidable weapon for the control and elimination of diphtheria; and by clinicians, who felt they had in diphtheria antitoxin the answer to treatment problems. A progressive decline in diphtheria over the past two decades has had a lulling effect on some communities with a resultant lukewarmness in diphtheria prevention. Implements for prevention and treatment are available, but adequate utilization is necessary. The historical background of both treatment and prophylaxis will be largely omitted, as others have performed this task both capably and exhaustively.

## TREATMENT OF DIPHTHERIA

The clinical classification of diphtheria by type is, in general, uniform in the United States, Canada, and Eng-

land, and is based on anatomical involvement. In Germany the classification is on the basis of clinical severity; anatomical involvement being considered secondary. On an anatomical basis and in order of severity from mild to severe, clinical types are as follows:

*Nasal*—Involvement of the anterior nares—little toxin absorption.

*Tonsillar*—Membrane on one or both tonsils—moderate toxin absorption.

*Pharyngeal*—Membrane present on the posterior wall or fauces, generally occurring in a person whose tonsils have been removed—toxin absorption moderately severe.

*Nasopharyngeal*—Involvement of the mucous membrane of the posterior nares, upper pharynx, and tonsils—toxin absorption severe.

*Laryngeal* (three types):

*Primary*—Sole involvement in the larynx—toxin absorption minimal.

*Tracheobronchial*—Involvement of the trachea, the bronchi, the smaller bronchioles, and occasionally the alveoli—toxin absorption moderate.

*Mixed*—Involvement of larynx plus extension downward, to involve the trachea and bronchi, or upward, to involve the nasopharynx or tonsils, occasionally beginning as tonsillar or nasopharyngeal and extending to the larynx—toxin absorption varied depending upon degree of involvement of nonlaryngeal structures.

*Treatment of Types*—Diphtheria is largely a local process with toxin elaborated at the site of infection and distributed throughout the body via the blood stream. In the gravis type of

\* Presented before a Joint Session of the Health Officers, Epidemiology, and Laboratory Sections of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 11, 1946.

diphtheria, invasiveness is reputedly increased. Irrespective of type of organism, or degree of invasiveness, main reliance in the treatment of diphtheria is on the early use of antitoxin. Antitoxin remains the most important therapeutic weapon, and the dictum still holds that prognosis in diphtheria is dependent upon the day of disease that antitoxin is first given. In general, gravis infections encountered in Europe during the past few years have been amenable to antitoxin if given in sufficient amount and early in the course of the infection.

The amount of antitoxin necessary for treatment is still debatable. When antitoxin was first used in the treatment of diphtheria, there were two schools of thought regarding the dosage. One school held that small amounts were ample while the other considered a large amount necessary, given in one or two massive doses. Later, the French introduced the small multiple dose method. With relation to present-day treatment of diphtheria, most infectious disease clinicians would be classified in the large dosage group. Actually, 4,000 units of diphtheria antitoxin are ample to neutralize the free or floating toxin in the blood at any given moment. Some toxin is already fixed to tissues which have a predilection for it, such as heart muscle and nerve tissue, and this situation antitoxin does not remedy. If the infection is of more than average severity, toxin continues to form until the reparative forces of the body can destroy diphtheria bacilli, and excess antitoxin is necessary to neutralize quickly newly formed toxin. In order to accomplish this a large dose of antitoxin is given.

In Germany, in the spring of 1946, as little as 2,000 units of antitoxin were given in the treatment of a mild case and 20,000 units as a maximum dose in a severe case. German clinicians who preferred to give more than 50,000

units of antitoxin stated that they could not give more on account of a shortage. Two eminent physicians in Munich, with communicable disease experience extending over twenty years or more, stated that during World War II necessity limited their use of antitoxin to 50,000 units in the most severe case, and it was their considered opinion that such an amount was sufficient. In London the dosage varied between 10,000 and 120,000 units among the majority of fever hospital heads; however, one was encountered who used a minimum of 40,000 units to a maximum of 250,000 units. The minimum amount of antitoxin used at the Herman Kiefer Hospital is 20,000 units and the maximum 120,000 units. I believe that we have probably been using too much antitoxin, which can be considered less harmful than not enough, but in general 60,000 units should be sufficient, because the case recognized early needs less, whereas in the late case much toxin is already fixed by tissues, and an excess of antitoxin is valueless. In general, the amounts used by clinical type at the Herman Kiefer Hospital are as follows: nasal 10,000 units; tonsillar—unilateral 20,000 units, bilateral 20,000–40,000 units; nasopharyngeal 60,000–100,000 units; laryngeal—primary 20,000 units, tracheobronchial 40,000 units; mixed 40,000–100,000 units.

*Route of Administration*—There is a difference of opinion regarding the route of administration, but in severe cases at least some of the antitoxin should be given by the intravenous route. The plan for a maximum dose of 80,000 units would be as follows: 40,000 units intramuscularly and 40,000 units intravenously. It would be desirable, if safe, to give the intravenous dose first, in order to neutralize the non-fixed toxin in the blood as quickly as possible, but serum sensitivity must be considered. It is necessary to obtain a history of sensitivity to horse

serum, horse dander, or in fact any allergy, and also to do a skin test to determine sensitivity to serum before administration by any route. At present most diphtheria sera are despeciated; that is, by enzymatic or pepsin digestion, nearly all of the albumen fraction has been removed, eliminating most of the reactions previously encountered. However, exceedingly sensitive individuals may still be sensitive to very small amounts of horse protein. If there is a history of sensitivity, a skin test should be given, using 0.01 ml. of raw horse serum intracutaneously; with a negative history 0.1 ml. intracutaneously. The test should be read at the end of 20 minutes, and, if negative, serum may be given intramuscularly, followed in 2 hours by an intravenous test dose of 1 ml. of serum in 9 ml. of 10 per cent glucose or distilled water, and if no reaction occurs, the intravenous dose may be given. Penicillin appears to have bacteriostatic value *in vitro* but is not of value in neutralizing toxin. If a highly sensitive person is encountered or if complications occur due to a secondary invader, or if the infection is multiple (such as simultaneous diphtheria and streptococcus infections), penicillin should be used in amounts of 50,000 Oxford units stat and 30,000 Oxford units every 3 hours for 5 days or more. In the instance of sensitivity, penicillin should be given, desensitization should be carried out, and antitoxin administered; for there is absolutely no substitute for antitoxin in the treatment of diphtheria.

*Management Other Than Administration of Serum*—All diphtheria patients, with the exception of cases of the nasopharyngeal and laryngeal forms, can be safely removed from isolation at the end of 10 days or 2 weeks if recovered and if nose and throat cultures are negative. In the instance of laryngeal cases, unless a tracheotomy has been performed, and in the ab-

sence of complications, 10 days' to 2 weeks' stay in hospital is sufficient. The nasopharyngeal type should always be hospitalized and remain in hospital for a minimum of 42 days, extension of time depending upon the duration of severe complications, such as myocarditis early in the disease and nerve palsies which occur generally between the 15th and 35th day of convalescence.

#### PROPHYLAXIS

It has been amply demonstrated that immunization against diphtheria is of value, although the marked decrease in incidence over the past twenty years cannot be entirely credited to this procedure. A number of antigens have been used during the past two decades, notably toxin-antitoxin, plain toxoid, and alum-precipitated toxoid. Toxin-antitoxin was the agent most commonly used in the early days of diphtheria immunization. Parke<sup>1</sup> showed conclusively that three injections of 1 ml. each, given at intervals of one to two weeks, protected 85 per cent of those injected. Immunity developed within 3 to 6 months, but reactions followed the injection of this material, reputedly due to bacterial protein in the toxin; also antitoxin in the mixture caused sensitization to horse serum. In an attempt to decrease toxicity, Ramon<sup>2</sup> produced formal toxoid in 1923, which accomplished the purpose without losing immunizing property. Under field conditions, giving two doses at intervals of 2 weeks, protection was afforded 80 to 90 per cent of those injected, while three injections protected over 90 per cent. Protection occurred more promptly than was noted following the use of toxin-antitoxin. However, plain toxoid also caused reactions.\* Further

---

\* Sensitivity to toxoid can be determined by the intracutaneous injection on the forearm of 1/10 ml. of a 1-20 dilution of plain toxoid (Moloney test). Sensitivity can also be determined by the pseudo or false Schick reaction but is not so reliable.

purification of diphtheria toxin was accomplished by Glenny and his associates<sup>3</sup>; they produced an alum-precipitated toxoid by precipitating plain toxoid with aluminum hydroxide. In the majority of field trials one dose of this material produced a Schick-negative status in over 90 per cent of inoculated children in from 6 weeks to 3 months. These early protection rates did not hold in the face of a declining case incidence, with the result that two doses were advocated with the interval 1 month or 6 weeks. Reactions occurred after injections with the alum toxoid; these were considered the result of sensitization to bacterial protein. Occasionally a sterile abscess or antigen cyst developed. Protection following the use of alum-precipitated toxoid appeared to occur more readily than after the use of the aforementioned antigens.

There were other antigens available for use; perhaps the most notable among which was TAF (toxoid, antitoxin flocules), prepared by Glenny and Pope,<sup>4</sup> rather widely used in Great Britain but uncommonly so in the United States and Canada. The antigen appeared less likely to produce reactions than those more commonly used; but from some reports at least, suffered from somewhat weaker antigenic power, and the fact, as with toxin-antitoxin, that it contained antitoxin which, in spite of refined and despeciated sera, still sensitized to horse serum. TAF could be used for older children and adults who were Moloney-positive, in three doses of 1 ml. at not less than 2 week intervals, as advocated by Harries.<sup>5</sup>

*Choice of Immunizing Agent*—Particularly during the past decade, studies have been carried out in many places with the idea of determining the most suitable immunizing agent, the correct dose, the number of doses, and the desirable age at which the agent may be safely given. It has been the objective of the Subcommittee on Diphtheria, of

the Committee on Administrative Practice of the American Public Health Association, to evaluate by field trials certain protective substances, and by their sponsored investigations to determine at first hand the agent of choice. From the results of extended studies, Volk and Bunney<sup>6</sup> concluded that in children with less than 0.001 unit of antitoxin per ml. of serum at time of injection, two doses of A.P.T. (alum-precipitated toxoid) at 3 week intervals gave the best antigenic response. In decreasing order of value were the following: three doses of F.T. (fluid toxoid) at 3 week intervals; one dose of A.P.T.; two doses of F.T. at a 3 week interval, and one dose of F.T.

Fraser and Halpern<sup>7</sup> preferred three doses of P.T. at 3 week intervals. Chesney,<sup>8</sup> using two doses of A.P.T. with a 4 week interval, produced a Schick-negative rate of 99.6 per cent in 1,555 inoculated children 2 months after injection of the second dose. It would appear from these studies and numerous others that A.P.T. in two doses at 4 to 6 week intervals, is the antigen of choice for children susceptible to diphtheria. The dose of A.P.T. in the United States is generally 0.5 ml. for each injection, whereas in Great Britain it is likely to be 0.2 and 0.5 ml.

Older children and adults, to whom plain toxoid or alum-precipitated toxoid is to be administered, should first be given a Moloney test, and if no skin reaction is noted within 24 to 48 hours, the toxoid may be safely administered. A.P.T. is the antigen of choice if smaller and more numerous doses are feasible. Instead of two doses of 0.5 ml. at monthly intervals, the following doses may be given at the same interval: 0.1, 0.3, and 0.5 ml. A severe reaction to any of these injections should result in discontinuance, as it is likely that reacting individuals have had previous experience with the organism, and the amount already given would cause

ample antigenic response. A common reaction is stinging or pain at the site of injection, which usually appears within 1 hour. A generalized reaction, accompanied by chills, headache, fever, or vomiting may occur.

Recently, Ross<sup>9</sup> has advocated the use of protamine diphtheria toxoid for older children and adults as well as for infants, to obviate reactions. He found that this product produced on infrequent occasions a slight erythema and induration. Field trials by Ross<sup>10</sup> and his associates indicated that 2½ to 18 months after a single subcutaneous injection of protamine toxoid, the antitoxin content of the blood in 78 per cent of young children was between 1/100 and 1/5 of a unit. When two doses of toxoid were injected, 79 per cent of the children had 1/10 of a unit some 2½ to 3 months after the second dose, and 60 per cent had 1/5 of a unit or more. Further field work is necessary to evaluate this antigen.

*Optimum Age for Injection*—It is recommended that all infants should be injected between the ages of 9 months and 1 year. A Schick test should be performed 6 months after completion of injection, and, if positive, another dose of toxoid should be given. Just prior to admission to school the Schick test should be repeated to determine the susceptibility of the child at that time. Those found non-immune should be reinjected; better still, the Schick test may be dispensed with and a "booster" or reinjection dose of plain or A.P. toxoid given. Jensen,<sup>11</sup> Fraser and Halpern,<sup>12</sup> Duke and Stott,<sup>13</sup> and Volk and Bunney<sup>14</sup> have emphasized that regardless of immunizing procedure, diphtheria immunity is not permanent. With time the amount of antitoxin in the blood diminishes. For this reason reinjection is necessary at certain intervals.

Reinjection against diphtheria has been studied by Volk, Bunney, and

Tripp.<sup>15</sup> They find that reinjection with P.T. or A.P.T. is highly effective, the latter slightly more so than the former. One small "booster" dose produced a satisfactory response with no allergic reaction observed among a group of 808 children. Local reactions were not severe enough to discourage reinjection. Wilkey<sup>16</sup> has concurred in the value of a small dose of plain toxoid as a reinforcing dose.

The *method of injection*, subcutaneous or intramuscular, and the *site*—deltoid area—have been widely used for the injection of diphtheria antigens. Other routes have been utilized, however. Jensen,<sup>17</sup> Fraser, Davey, and Halpern,<sup>18</sup> and Phair<sup>19</sup> have injected individuals by means of nasal instillation of toxoid. Blatt, Fisher, and van Gelder<sup>20</sup> have used the intradermal method, giving a dose of 1/10 ml. of plain or alum-precipitated toxoid and reporting good results. Others have advocated the intradermal method for reinjection. The intranasal method may lead to untoward reaction as Anderson<sup>21</sup> and Phair<sup>19</sup> have reported. Both methods need further study to warrant practical and statistical assessment.

#### SUMMARY

1. Antitoxin is the agent of choice in the treatment of diphtheria, and prognosis is still directly proportional to the day of the disease that antitoxin is first given, regardless of type of organism encountered, though the gravis type infection may be more refractory to treatment.

2. Penicillin is not a substitute for antitoxin but under certain circumstances is an adjunct in the treatment of diphtheria.

3. Among antigens available for protection against diphtheria, A.P.T. is the agent of choice, given in two doses at intervals of 1 month to 6 weeks.

4. In the presence of a declining case and carrier incidence, "booster" doses of antigen are necessary. "Booster" doses of A.P.T. are suggested at 2 years of age, and again before entering school for the first time. Thereafter, an unusual incidence of the disease in the community warrants further antigenic stimu-



lation, proceeding with caution and using plain toxoid after the age of ten to twelve years.

## REFERENCES

1. Park, W. H. Toxin-Antitoxin Immunization Against Diphtheria. *J.A.M.A.*, 79:1584, 1922.
2. Ramon, G. Pouvoir Flocculant et Pouvoir Toxique de la Toxine Diphtherique. *Compt. rend. Soc. de biol.*, 89:2, 1923.
3. Glenny, A. T., Pope, C. G., Waddington, H., and Wallace, N. Immunological Notes: Antigenic Value of Toxoid Precipitated by Potassium Alum. *J. Path. & Bact.*, 27:38, 1926.
4. Glenny, A. T., and Pope, C. G. Diphtheria Toxoid-Antitoxin Floccules. *J. Path. & Bact.*, 30:587 (Oct.), 1927.
5. Harries, E. H. R. *Control of the Common Fevers: Diphtheria*. London: The Lancet Ltd, 1942, p. 32.
6. Volk, V. K., and Bunney, W. E. Diphtheria Immunization with Fluid Toxoid and Alum-Precipitated Toxoid. *A.J.P.H.*, 32:690 (July), 1942.
7. Fraser, D. T., and Halpern, K. C. Antitoxin Response to Diphtheritic Antigens in Children. *J. Immunol.*, 33:323 (Oct.), 1937.
8. Chesney, G. Diphtheria Immunization: Optimum Spacing of Doses of Alum-Precipitated Toxoid. *M. Officer*, 61:127 (Apr 1), 1939.
9. Ross, V. Preparation and Immunizing Properties of Protamine Diphtheria Toxoid. *Am. J. Dis. Child.*, 68:172 (Sept.), 1944.
10. Ross, V., Clapp, F. L., and Schimpf, B. W. Antitoxin Titres Following Immunization with Protamine-Precipitated Diphtheria Toxoid. *A.J.P.H.*, 36: 645 (June), 1946.
11. Jensen, C. Antitoxin Curve in Children After Active Immunization with Diphtheria Anatoxin with Special Reference to Duration of Antitoxin Immunity. *Acta. path et microbiol. Scandinav.*, 10:137, 1933.
12. Fraser, D. T., and Halpern, K. C. Diphtheria Studies, Toronto. *A.J.P.H.* (Supplement), 30:44 (Mar.), 1940.
13. Duke, H. L., and Stott, W. B. Duration of Artificial Immunity to Diphtheria. *Brit. M. J.*, 2: 710 (Dec. 4), 1943.
14. Volk, V. K., and Bunney, W. E. Re-immunization Against Diphtheria of Previously Immunized Children. *A.J.P.H.*, 32:700 (July), 1942.
15. Volk, V. K., Bunney, W. E., and Tripp, J. T. Comparative Speed of Response of Previously Immunized and Non-Immunized Children to Fluid and Alum-Precipitated Diphtheria Toxoid. *A.J.P.H.*, 33: 475 (May), 1943.
16. Wilkey, J. R. Diphtheria Toxoid and the Reinforcing Dose. *Canad. Pub. Health J.*, 33:446 (Sept.), 1942.
17. Jensen, C. Active Immunization Against Diphtheria by the Subcutaneous and Intranasal Method. *Proc. Roy. Soc. Med.*, 30:1117, 1937.
18. Fraser, D. T., Davey, E. L., and Halpern, K. C. Antitoxic Response to Concentrated Diphtheria Toxoid Applied to Nasal Mucous Membrane. *Canad. Pub. Health J.*, 31:376 (Aug.), 1940.
19. Phair, J. J. Diphtheria Immunization: Reactions of Adults Following Intranasal Toxoid. *Am. J. Hyg.*, 35:292 (Mar.), 1942.
20. Blatt, M. L., Fisher, S., and van Gelder, D. W. Intradermal Immunization: Diphtheria. *Am. J. Dis. Child.*, 62:757 (Oct.), 1941.
21. Anderson, H. C. Nasal Sequelae to the Diphtheria Vaccination of Probationer Nurses. *Ugeskr. f. Læger*, 101:779, 1939.

# Water Supply

## Engineering Section

THIS committee submitted a report before the Engineering Section at the 1944 meeting of the Association. We endeavored at that time to appraise wartime developments in connection with public water supplies which appeared to have had a peacetime significance. In the meantime, certain trends have been established. It is our purpose at this time to discuss current aspects of water supply control of special interest to the public health field. Some aspects of our discussion will be elementary or self-evident to specialists, but they are being reviewed to focus attention upon the administrative implications which may be overlooked in the preoccupation with technical matters. It is believed that this is an opportune time to state the objective of this committee, namely: *safer water supplies*. To this end, the committee is devoting its attention to the following:

1. The determination of what diseases are now transmitted by potable water supplies
2. Proper treatment of water to eliminate these diseases
3. Proper tests to determine when this has been accomplished
4. The proper training of personnel to insure effective operation and control and thus give maximum protection to the consumer by insuring the delivery of water of safe sanitary quality

Present trends and events in the field of public water supply of special interest to public health workers appear to be as follows:

### FREE RESIDUAL CHLORINATION

There is a lag between the development and refinement of technical processes, laboratory technique, etc., and their application in the routine treatment and supervision of public water supplies. This is emphasized by the present status of chlorination for the production of free residual chlorine; that is, superchlorination or break-point chlorination. In spite of the extensive literature upon the subject and in spite of the rather numerous supplies which are being subject to free residual chlorination, there is still a reluctance on the part of many water supply officials to avail themselves of this treatment process. It seems pertinent, therefore, to focus attention upon the fact that the use of chlorine doses sufficient to give free residual chlorine rather than combined residual chlorine (chloramines) will result in the following advantages:

1. Effective disinfection in spite of the adverse influences of short detention period, high concentration of organic matter and free ammonia, high pH values, and lower water temperatures
2. The production of free residual chlorine which is stable and generally tasteless, although high concentrations of free residual chlorine may produce a detectable chlorinous odor
3. The destruction by oxidation of taste and odor producing compounds
4. The control of growths in water mains
5. The prevention of biochemical corrosion of water mains through the destruction of organisms
6. The prevention of the biochemical reduction of sulfates to sulfides

### COMMITTEE ON WATER SUPPLY

Organized 1922. Published reports: *A.J.P.H.*, Sept., 1924, Apr., 1925, Feb., 1926, July, 1927, Apr., 1928, Feb., 1929, May, 1930. *Year Books* 1930-1931, 1931-1932, 1932-1933, 1934-1935, 1937-1938, 1939-1940, 1940-1941, 1941-1942, *A.J.P.H.*, July, 1945.

In addition to the above advantages of superchlorination, the following results are of special significance because they may be secured in the absence of filtration when a sufficient detention period is available in a reservoir or basin. These effects are as follows:

1. The bleaching of color
2. The precipitation of iron and manganese
3. The coagulation of soluble organic matter
4. The control of algae and other organisms

While the qualitative flash test for free residual chlorine has not given consistent results, the quantitative orthotolidine-arsenite (OTA) test provides a simple technique for the control of chlorination for the production of chemically active, free residual chlorine, and also for the rational control of the use of ammonia in those few instances where the practice of chloramination still may be warranted in spite of the well established lower disinfecting powers of combined residual chlorine. The OTA test, therefore, may be considered as replacing the standard OT test for the general control of chlorination processes.

The disclosure of the marked difference in the disinfecting rates with free residual chlorine and combined residual chlorine, the development of the practice of free residual chlorination, and the availability of a test necessary for its rational control represent the most important development in the field of water disinfection since the standard orthotolidine test was developed many years ago. A major step in the improvement in the quality of public water supplies would result were the conditions surrounding chlorinated supplies, including chloramination,\* reap-

praised in the light of modern chlorination technique and were the tests for free residual chlorine used as a routine for the more rational control of chlorination for disinfecting purposes and for the other benefits outlined above. We have the tools but we need to stimulate their more general use, especially for unfiltered supplies.

#### CHLORINE DIOXIDE TREATMENT

The use of chlorine dioxide for the destruction of taste and odor producing compounds, referred to in the 1944 report of this committee, is being used more generally. While additional experience is needed to establish this process of taste and odor control, it is significant that while chlorine dioxide itself does not disinfect water it does not interfere with the effectiveness of chlorination. If preliminary indications are confirmed by more experience, chlorine dioxide may prove to be an aid in disinfection by maintaining a higher oxidation potential. This is the converse of chloramination which provides an inhibited chlorination reaction.

#### THE FLUORINATION OF POTABLE WATER SUPPLIES

The application of sodium fluoride to public water supplies to minimize the incidence of dental caries was started in 1945 at Newburgh, N. Y., Grand Rapids, Mich., and Brantford, Ontario.

Subsequently this treatment process

\* Unpublished data from the Harvard Engineering School disclose that free residual chlorine consists of hypochlorous acid ( $\text{HOCl}$ ) and the ( $-\text{O Cl}$ ) radical. One-half of the free residual chlorine is hypochlorous acid and one-half ( $-\text{O Cl}$ ) radical at pH 8.0. The concentration of the latter increases with corresponding increases in pH value. Furthermore, these data disclose that the ( $-\text{O Cl}$ ) radical has a very

much lower disinfecting power than hypochlorous acid. In fact, its disinfecting power is lower than an equivalent concentration of chloramines. Therefore the presence of free residual chlorine at high pH values does not disclose the same favorable disinfecting conditions as with low pH values. Chloramination of waters of high pH value, therefore, may be preferable to free residual chlorination, such as waters softened by the lime-soda process or waters treated with lime for corrosion prevention. Data as to experience with various waters are needed to permit a more intelligent appraisal of the field of usefulness of chloramination with waters of high pH value. In the meantime it seems evident that one should be critical of the effects of high pH values upon the disinfecting action of free residual chlorine.

has been started at Midland, Mich., Garrettsville, Ohio, and Marshall, Tex., and plans are being made for treatment of the supplies at Evanston, Ill., and Sheboygan, Wis., and certain supplies in Massachusetts and Oregon.

The cost of the demonstrations including special medical and dental supervision, laboratory work, etc., is very much greater than the cost of the treatment of water supplies in a routine manner. For instance, the demonstration at Newburgh, N. Y., is costing approximately \$25,000 a year for ten years, whereas the chemical feed equipment cost only \$350, and the cost of sodium fluoride for the treatment of 3,000,000 gallons of water per day is only approximately \$1,500 per year, or a per capita cost of 5 cents per year.

It is premature to determine the results of these demonstrations because it is well known that fluorine in potable water will exert a significant influence only upon the permanent teeth of children consuming such fluorine treated waters during the period of formation of the teeth. It is pertinent to remark, however, that no engineering problems have developed in the application of sodium fluoride to public water supplies of various sizes. The standard test for fluorine, while cumbersome, is satisfactory for the control of these studies, although the Lamar test<sup>1</sup> is favored for the control of the treatment of the ground water supply of Marshall, Tex., and a modified Elvove test is being used in Massachusetts which is claimed to be much faster and more satisfactory for field use. A simpler test, however, is needed for routine plant control.

Consumer reaction has been very favorable and in fact the tendency is for many municipalities to wish to introduce this treatment process prior to the development of basic scientific data through the technical experiments and demonstrations now under way.

#### DIATOMACEOUS EARTH FILTERS

While exhaustive studies as to the effectiveness and adaptability of these filters to meet the qualifications of the Engineering Corps, U. S. Army, have been conducted and while a few companies are manufacturing filter units of this type, so far there has been no record of the installation of diatomaceous earth filters for the clarification of public water supplies, except one city which has a \$25,000 experimental plant for the clarification of stored surface water. Such units, however, are being installed in limited numbers at artificial swimming pools. This should provide satisfactory opportunities for observing the effectiveness of the units in the hands of the average operator. One cannot overlook the fact that this development represents the only major change in filtration practice since rapid sand filtration was started. It would appear that this process of filtration with reduced plant size will be coordinated with current emphasis upon more thorough pretreatment. The process would seem to have special usefulness in the filtration of relatively clear surface water where prior coagulation is not so important. In fact, the schistosome cercariae were found to be removed by experimental diatomaceous filters without coagulation, whereas these very motile organisms will penetrate through sand filters. These findings are consistent with the results of experiments with the cysts of *Endamoeba histolytica*.

#### HIGH RATE FLOCCULATING AND CLARIFYING UNITS

The committee has little to report upon the effectiveness of these units in the treatment of waters of various characteristics other than that very satisfactory results have been secured through the use of relatively few installations made during the war. Over-all treatment periods of 1 to 1½ hours

for flocculation and clarification by upward flow through so-called sludge "blankets" or slurry are sufficient when the coagulant dose is satisfactory. Effective control, therefore, is essential to secure the advantages of this treatment method.

#### BACTERIOLOGICAL EXAMINATION OF WATER

In the ninth edition of *Standard Methods for the Examination of Water and Sewage*, no basic change has been made in the standard bacteriological tests for coliform organisms except that the choice of liquid media used in the alternate "partially confirmed test" is restricted to brilliant green bile. The production of gas in any amount in primary lactose broth tubes or in the secondary brilliant green bile tubes signifies positive results. There are those who object to accepting delayed or limited gas production as indicative of the presence of coliform organisms of sanitary significance. Furthermore, there are those who feel that brilliant green bile is not the most appropriate confirmatory liquid medium for use with certain classes of waters. Inasmuch as *Standard Methods for the Examination of Water and Sewage* generally is followed as a guide by water works laboratories, and as the 1946 revision of the *Drinking Water Standards* of the U. S. Public Health Service officially refers to the standard bacteriological technique as given in the latest edition of the methods, it is desirable for the administrative implications of these developments to be reviewed.

The text of the *Drinking Water Standards* provides for the exercise of administrative discretion in the interpretation of bacteriological results. That is, there is no need for blind acceptance of the results of the standard technique, but rather the attitude is encouraged to the effect that a positive test for coliform organisms indicates exposure of a

supply to pollution, or the existence of channels for the entrance of pollution into a supply, the sanitary significance of which must be determined by a survey to ascertain whether the pollution is likely to be accompanied by contamination of human origin. The exercise of technical judgment based on experience is necessary, therefore, to use this rather inclusive and therefore nonspecific test for bacterial pollution of water. For this reason, the *Drinking Water Standards* purposely are liberal, permitting 10 per cent or less of the 10 ml. tubes of a series of samples to be positive for coliform organisms. Obviously, the value of this test is reduced unless a number of representative samples are collected under known conditions so that laboratory data of statistical significance may be properly appraised in the light of field conditions. The presence of coliform organisms in a sample, therefore, should be considered as indicating a need for a search for their origin and significance, and not that the sample necessarily represents water of unsafe sanitary quality.

While the above basic attitude or policy is generally accepted, the subject is being reviewed at this time because it is evident that the present bacteriological techniques are not sufficiently exact to furnish sanitary engineers with a precise measure of sanitary quality. Engineers, however, will desire the continued refinement of bacteriological technique with the hope that a more precise test may be developed to disclose contamination of definite public health significance. High hopes have been raised in some quarters that the Eijkman test would fulfil this need, but this test so far has not been accepted as having sufficient specificity for this purpose.

On the other hand, progress in water treatment may outstrip progress in the development of more precise laboratory procedures for the bacteriological ex-

amination of water. For instance, experience with free residual chlorination discloses that with certain supplies all lactose-fermenting bacteria giving positive presumptive tests may be eliminated by this process. This suggests that the criterion of successful treatment is the absence of *positive presumptive tests* rather than the absence of *positive confirmed tests* for members of the coliform group. Therefore, under these specific circumstances a simple technique providing a broader measure of general bacterial pollution would be more applicable for practical purposes than refinement in bacteriological examination to secure greater specificity. The use of the presumptive test, however, would provide a more rigid standard of bacterial quality because of its greater scope, so a new set of guiding principles would have to be developed as to interpretation and application. While the simplicity and speed of the presumptive test may provide a useful means of controlling free residual chlorination, it is evident, however, that this test cannot be used in connection with raw waters which may be exposed to bacterial pollution of little or no sanitary significance, or in the appraisal of supplies which may be exposed to secondary pollution while the water flows through open equalizing reservoirs, etc. Therefore, it may be concluded that the present standard test for coliform organisms or the more inclusive presumptive test may be satisfactory for the control of treatment processes, but that a more specific test is needed for determining the sanitary quality of raw waters or the sanitary quality of water as delivered to the consumer.

Accordingly, this committee attempted to organize a program for the typing of coliform organisms which were present in treated supplies where knowledge as to sanitary conditions was well established, for the purpose of collecting

more extensive data upon the relative sanitary significance of various members of the coliform group. This investigation had to be restricted to studies in New York and Massachusetts because of war conditions. Final results are not available at this time.

Preliminary data from Massachusetts as to the typing of about 800 cultures disclose no trends which may be correlated with sanitary conditions.

The preliminary studies in New York State included the typing of coliform organisms isolated from several treated supplies. There was a sufficient number of positive tests to permit the collection of quantitative data for only one of these supplies. This supply serves one of the larger cities in the state and is secured from two large lakes which are free from appreciable pollution of human origin. Treatment by chlorination is effective, as disclosed by results of the examination of samples collected throughout the year at a point immediately after treatment. The chlorinated water so treated flows through two large equalizing reservoirs which, because of their size, are uncovered. The reservoirs are so constructed that surface drainage is not a problem and they are fenced and patrolled. Samples collected from the reservoirs and also from the distribution system are free from coliform organisms during the colder season of the year. There is progressive increase in the degree of pollution during the summer, and at times, 15 per cent of the 10 ml. portions of series of samples contained coliform organisms. The only known source of pollution is dust and the occasional presence of a few water fowl.

The following tabulation gives the results of the typing of the coliform organisms isolated from this supply of which 115 cultures were isolated. Ninety-three of the cultures have been typed so far. Fifty-seven, or 61 per cent, of these cultures belong to the

intermediate group according to the *Bergey's Manual*, whereas 10 cultures, or 11 per cent, belong to the coli section and 26 cultures, or 28 per cent, to the aerogenes section.

*Division of Laboratories & Research  
New York State Department of Health*

*Temporary Classification of Cultures*

*(Classified in accordance with Bergey's  
Manual—Fifth Edition, 1939—  
Second Printing, 1940)*

Cultures isolated from portions of samples of a large public water supply, confirmed for presence of bacteria of the coliform group by techniques outlined in *Standard Methods for the Examination of Water and Sewage*.

Total number of cultures examined up to  
October 15, 1946 = 115

*Coli Section*

*Bact. coli* = 10

*Intermediate Section*

*Bact. coli* var. *acidi lactici* = 2

*Bact. coli* var. *neapolitana* = 9

*Bact. coli* var. *comminior* = 4

*Bact. freundii* = 42

*Aerogenes Section*

*Bact. aerogenes* = 26

Not completed = 22

It is significant that the probable origin of the bacterial pollution of the water from the reservoirs of this supply cannot be inferred from the results of the typing of the coliform organisms found present. The relative proportion of the three subgroups may be of some significance, but there is no consistency in the available data which would permit the establishment of guiding principles.

Therefore, for the present, it would appear that coliform organisms as a group would have to be used in accordance with standard methods as indicator of bacterial pollution of water, with emphasis upon the need for a survey to permit one to appraise the sanitary significance of such pollution. It is

disconcerting, however, for sanitary engineers not interested in details of bacteriological technique to realize that no distinction is made by the standard technique or even by the usual typing tests between *Bact. coli* and, for instance, organisms associated with the rotting of vegetation; namely the *Erwiniae*. Therefore, as stated previously, there will be a continued demand for more precision as to the bacteriological examination of samples of potable water to meet the needs of those lacking specialized training required for discriminating appraisal of any sanitary significance of various members of the coliform group, or needed in appraising the results of the standard test for coliform organisms. The committee urges, therefore, that there be a more intensive typing of coliform organisms isolated from a variety of the supplies so as to accumulate quantitative data for a greater variety of supplies than are available at present. The continued study of a single-media test like the use of Lauryl Sulfate Tryptose Broth for the detection of coliform organisms, and of the more specific tests like the Eijkman test for *Bact. coli* also should be encouraged. The streptococcus test also might be reappraised as to its applicability.

DRINKING WATER STANDARDS

The acceptance by the Board of Directors of the American Water Works Association of the *Drinking Water Standards* as standards for all public water supplies in the United States and the Board's voluntary acceptance of the authority of the various state departments of health in matters relating to compliance with these *Standards* represents an important constructive step of great credit to the American Water Works Association, and of significance to public health. This official act has extended the significance and applicability of the standards from the legally

restricted field of water supplies serving common carriers, to public water supplies in general, and should result in a more uniform and improved practice. This expansion of the influence of the *Drinking Water Standards*, however, makes it essential for state departments of health as "reporting agencies" to exercise discretion and best technical judgment in the interpretation and enforcement of the *Drinking Water Standards*. The introduction to the *Standards* advocates this policy. In other words water supplies should be appraised by public health officials in the light of all factors affecting the sanitary quality of the water from the source of supply to the service pipe of the consumer, so that ample stress will be placed on equipment, supervision and maintenance, effectiveness of treatment and laboratory control, rather than the results of the bacteriological examination of the samples being over-stressed. The appraisal of water supplies in this broad manner requires the exercise of discriminating technical judgment in the evaluation of many intangible factors, such as reliability of supervision. This appraisal, however, should go still further when considering so-called "sanitary defects," which are so defined by the *Standards* as to include cross-connections, backflow connections, and faulty plumbing fixtures.

It is generally accepted that local water supply officials are responsible for the quality of water reaching the premises of the consumer. The revised *Drinking Water Standards* recognizes, however, that conditions on consumer premises are the responsibility of the consumer. Inasmuch as the interest of the consumer, that is, the public, is the quality of the water reaching the ultimate tap of the consumer and, as the consumer cannot be expected to purchase and maintain suitable plumbing fixtures, local health officials interested in the quality of the water actually

utilized by the consumer must exercise supervision through the enforcement of plumbing codes and by coöperating with municipal building departments when such matters are not handled by local health departments. It is fortunate, therefore, that the *Standard Plumbing Code*, now under development by the American Standards Association with the active assistance of the American Public Health Association and the American Society of Mechanical Engineers, is nearing completion and will be available on a national basis to those concerned with this important field.

#### OBSCURE WATER-BORNE DISEASES

As previously stated, there seems to be no evidence that unusual water-borne diseases have been imported into this country from the tropics by the returning armed forces. Infectious hepatitis has been reported to be water-borne in several instances. This disease recently was added to "reportable diseases" in New York State. Definite evidence as to whether or not water is the normal vector for the transmission of this virus disease has been lacking, so the discussion of the subject at this conference is welcome.

Poliomyelitis has been considered in this connection because the virus has been isolated from sewage. In this connection, it would seem pertinent to follow the attitude of Maxcy<sup>2</sup> as to the criteria for the water-borne transmission of disease. Briefly, they are as follows:

1. Those diseases which are associated with insanitary conditions
2. Which are reduced in incidence when water supply improvements are made
3. Which increase in incidence with epidemic rapidity when water supplies are subject to temporary pollution, or when treatment fails
4. Which have greater incidence among those using a suspected supply than among other groups using different supplies which are alike in all other pertinent respects



Maxcy concludes that evidence that poliomyelitis is water-borne is "conspicuous by its absence." In spite of this reassuring situation, it is gratifying to learn by recent work in Michigan,<sup>3</sup> that the virus of poliomyelitis is nothing like as resistant to the action of chlorine as previously was thought to be the case, inasmuch as 0.2 p.p.m. free residual chlorine will destroy the virus in a matter of 10 minutes. This is another illustration of the value of free residual chlorination.

#### DISCUSSION

The discrepancy between the state of technical developments and the degree to which such developments have been applied focuses attention on the basic problem facing local water supply officials as well as health agencies interested in improving the quality of public water supplies. The basic problem is the allocation of adequate funds for the employment of properly trained personnel to operate satisfactory water works structures. Further technical advances and efforts of health departments will be of little avail unless there be concerted effort to improve the overall planning of water supply operation, including the important aspect of financing, especially in connection with small supplies.

The results of inspections and sampling of wells and springs serving rural property disclose in general that the majority of such sources of water supply yield water containing coliform organisms. In most instances this is because of poor construction of wells or springs which permit the entrance of incidental pollution rather than to pollution from permanent sources of human origin. On the other hand, many excellent bulletins are available describing the construction and proper location of wells and springs serving rural properties and for the disposal of excreta and sewage so as not to expose rural

water supplies to pollution. It is evident, therefore, that there is the same discrepancy between the state of technical knowledge and its application as with public water supplies.

A general appraisal of this situation would seem to indicate that little can be expected through the efforts of state departments of health until local health service is expanded to a point where sanitary inspectors are available for advice and assistance on a scale somewhat commensurate with conditions prevailing in urban communities. Such public health services would improve the supervision of small public water supplies serving limited population groups, such as real estate developments and small hamlets, summer resorts, etc. There seems to be a need, therefore, for the consideration of the administrative aspects of this situation to the end that the gap between established procedures and their application may be minimized.

#### CONCLUSIONS

A consideration of the many factors affecting the delivery of water of safe sanitary quality to the consumer stresses the need for the integration of the several fields of activity in a manner which would permit the development of a planned program within the financial resources at the disposal of local water supply officials and for careful utilization of existing structures and for future expansion so that undue stress will not be placed on any one phase of the problem. Generally speaking, however, experience has shown that intelligent and well trained personnel will do wonders with poor equipment, whereas modern equipment in the hands of shiftless or improperly trained personnel will soon deteriorate or give poor results.

#### REFERENCES

1. Lamar, Wm M. The Determination of Fluoride in Water—A Modified Zirconium—Alizarin Method *Indust & Engin Chem*, Vol 17, No 3.

2. Maxcy, K. F. Hypothetical Relationship of Water Supplies to Poliomyelitis. *A.J.P.H.*, 33:41, 1943.

3. Ridenour, C. M., and Ingols, R. S. Inactivation of Poliomyelitis Virus by Free Chlorine. *A.J.P.H.*, 36:639, 1946.

CHARLES R. COX, *Chairman*  
H. J. DARCEY  
ARTHUR E. GORMAN  
RAYMOND F. GOUDEY

L. L. HEDGEPEETH  
H. S. HUTTON  
CHARLES M. SPAULDING  
ARTHUR D. WESTON

---

## Forty Years of the Russell Sage Foundation

On April 20, 1947, the Russell Sage Foundation celebrated its 40th anniversary with a brief historical statement of its activities issued by its general director, Shelby M. Harrison. It has spent more than \$21,000,000 "for the improvement of social and living conditions in the United States," \$12,000,000 in the Foundation's direct work and \$9,000,000 in grants to 119 different social agencies and special projects.

Among some of the Foundation's early and continuing activities is Forest Hills Garden (N. Y.), which was intended to demonstrate the values of careful land planning and architectural controls. It also originated the Regional Plan of New York. It has sold 5,200,000 copies of the educational measurements scales developed in its Department of Education. The Camp Fire Girls were organized by Dr. and Mrs. Luther Gulick while he was director of the Department of Child Hygiene. The Foundation helped finance the Pittsburgh Survey, after which it organized its own Department of Surveys and Exhibits, which has conducted surveys of social

conditions in many communities. Later in the anniversary year a two volume history will be published giving details on both grants and direct work.

Coincident with the anniversary report, announcement was made of the appointment of Donald Young as general director of the Foundation to succeed Shelby M. Harrison whose retirement, after 35 years of service, becomes effective on June 30, 1947. He has been general director for the last 16 years of that period.

The new general director, Mr. Young, comes directly from the Social Service Research Council where he has been executive director since 1945. He has been Professor of Sociology at the University of Pennsylvania, is a member of the American Academy of Political and Social Science, the Population Association of America, the Public Affairs Committee, and the American Statistical Association, among others, and author of a number of books and articles, among them *Minority Peoples in the Depression* and *Minority Peoples in a Nation at War*.

# An Epidemic of an Acute Meningo-encephalitis in Giles County, Tennessee

## An Unusual Disease

WALTER C. HUMBERT, M.D., C. B. TUCKER, M.D., F.A.P.H.A.,  
K. T. MOSLEY, M.D., AND L. K. BISHOP, M.D.

*Tennessee Department of Public Health and the Department of Preventive  
Medicine and Public Health, and Pediatrics, Vanderbilt University  
School of Medicine, Nashville*

DURING the past few years an increase has been noted in the number of reported cases of virus infections in the United States. Poliomyelitis is one of those infections which have shown an increase, there being more cases reported and being more widespread in epidemic form in 1946 than in any recent previous year. Reports of respiratory infections of virus origin also appear to be on an increase. An outbreak of a very unusual infection, presumably due to a filterable virus, occurred in Giles County, Tennessee, and adjacent areas during the summer of 1946. It is the purpose of this report to give briefly a description of the clinical manifestations of the disease and the features of the epidemic.

During the second week of June, 1946, the physicians in Giles County reported to the local health officer the occurrence of an outbreak of an unusual disease. A clinical and epidemiological investigation was instituted immediately. During June and July, 209 cases were reported to the local health department. Sporadic cases have continued to occur up to the date of this report. Because of the failure of the families to seek medical attention due to the characteristics of the infection, it is estimated that there were two unre-

ported cases for every case reported. In addition, many cases occurred in counties adjacent to Giles County. An epidemiological and clinical history was obtained on 105 of the 209 reported cases. This report is based on these cases. It is interesting to note that no cases of acute anterior poliomyelitis were reported to the local health department during 1946 prior to the preparation of this report.

### CLINICAL MANIFESTATIONS

*Signs and Symptoms*—The majority of the cases were characterized by sudden onset of fever, which usually was preceded by chilly sensations (Table 1). This was followed shortly by severe,

TABLE 1  
*Predominating Symptoms of Cases of an Epidemic of Meningo-encephalitis in Giles County, Tennessee, June, 1946*

Symptoms	Number of Cases	Per Cent
Total	105	....
Headache	99	94.3
Fever	99	94.3
Nausea	81	77.1
Vomiting	79	75.2
Stiffness of Neck	64	61.0
Pain in Eyes	58	55.2
Photophobia	54	51.4
Pain in Extremities	38	36.2
Constipation	31	29.5
Pain in Abdomen	30	28.6
Sore Throat	28	26.7
Pain in Back	27	25.7
Chill	25	23.8
Diarrhea	4	3.8

unremitting headache, malaise, muscle aches, lumbar pain, and complaints of stiffness of the back and neck. In addition to these, there was one other outstanding complaint, retro-bulbar pain, which occasionally was associated with photophobia. The patients usually volunteered the information that motion of the eyeballs was exquisitely painful and that they preferred to lie in a darkened room with their eyes closed.

Soon after the onset of the above symptoms, marked nausea and vomiting followed which persisted for approximately 24 hours. This was associated with abdominal pain in the severe cases and occasionally with constipation. No significant diarrhea was noted. Despite the finding of vesicular pharyngitis in about 90 per cent of the cases, only 26 per cent of the cases complained of sore throat. These patients complained more of a dryness of the posterior pharynx than of true pain.

Neurological complaints were confined to hyperesthesias and paresthesias which were of only moderate intensity. No history of convulsions was obtained from any patient.

The picture found on physical examination was remarkably uniform. The general appearance of the patients was that of an acutely ill, irritable individual who obviously was quite uncomfortable, lying quietly in bed and extremely reluctant to move. Rarely was any significant degree of disorientation found. A mild generalized lymphadenopathy was found frequently. No skin lesions were observed.

Examination of the eyes revealed no significant conjunctivitis. Pupillary reactions were normal and no nystagmus was noted. Extreme retro-bulbar tenderness was demonstrated by either gentle pressure on the eyeballs or motion of the eyes. Fundiscopic examination was normal in all cases.

The ears, nose, and mouth were normal in all patients; however, a typical

vesicular pharyngitis was found in almost all the cases examined and in many of the familial contacts without other evidence of illness. The pharynx presented a mottled, edematous appearance with vesicles found chiefly in the tonsillar area, posterior pharyngeal wall, and occasionally on the uvula and soft palate. The individual vesicle was a superficial, small lesion from 0.5 to 1 millimeter in diameter, presenting a "dew-drop" appearance on the pharyngeal mucosa. In contradistinction to the lesions found in herpes simplex<sup>1, 2, 3</sup> infections of the mouth, there was neither any involvement of the gums, buccal mucosa, or tongue, nor any tendency to ulceration. The pharyngitis was further distinguished from herpes by the absence of pain.

No significant abnormality was found on examination of the heart and lungs.

In the majority of cases the abdomen was somewhat distended. Mild abdominal tenderness was elicited in the severe cases only.

On neurological examination a positive Brudzinski reaction was obtained uniformly; however, the Kernig reaction was negative. Rather marked spasticity of the paravertebral muscles with inability to raise the head with the shoulders elevated, similar to that found in acute poliomyelitis, was present usually in the early stages of the disease. The deep tendon reflexes were equal and active, being slightly hyperactive at onset of the illness. The superficial reflexes were normally active with the exception of the abdominal reflexes. In cases with abdominal distention these latter reflexes were diminished or absent, though the cremasteric reflexes remained active. No other pathological reflexes were noted. Moderate transitory weakness of the left anterior tibialis muscle was demonstrated in only one case, a 19 year old white female. No other instances of muscle weakness were found nor did any cases of "lead-pipe"

rigidity of the extremities occur.

*Course of the Disease*—In children and in the majority of adults recovery was complete in 24 to 48 hours. In many of the adult cases, however, the illness continued from 5 to 10 days with high fever, severe headache, malaise, and with the other symptoms which have been related. Except for general weakness, all these cases recovered without ill effects. No deaths were reported.

*Laboratory Findings*—The hemoglobin and red blood cell counts were normal. A mild leukocytosis ranging from 8,000 to 13,000 was noted with differential counts showing a slight increase in lymphocytes—average 42 per cent of the total count; no increase in eosinophils was present. Urinalysis revealed nothing abnormal. Agglutination tests for *Proteus*, *Brucella*, typhoid, and paratyphoid were negative as were blood, nose, and throat cultures.

Three spinal fluid examinations were performed with the following results: (1) 170 white blood cells per cu. mm. of spinal fluid, negative Pandy test (quantitative sugar and protein determinations were not performed); (2) 42 white blood cells per cu. mm. of spinal fluid, negative Pandy test, and 56 mg. per cent total spinal fluid protein; (3) 8 white blood cells per cu. mm. of spinal fluid, negative Pandy test, and 47 mg. per cent total spinal fluid protein. The first two specimens were obtained from two patients on the 7th day of their illness and the other specimen was obtained on the 8th day of illness of a third patient. Quick-frozen spinal fluids were submitted to the National Institute of Health for cultures, which were negative.

Quick-frozen blood and fecal specimens also were submitted to the National Institute of Health for examination. These examinations have not been completed.

Nasopharyngeal washings were col-

lected early in the disease from 4 severe cases. These were quick-frozen and transported in dry ice and submitted to Dr. G. John Buddingh of the Department of Pathology, Vanderbilt University School of Medicine, for virus study.

Investigations undertaken with these nasopharyngeal washings are currently in progress and, as yet, are far from completion. Dr. Buddingh has given permission for the following tentative statements to be made in regard to his observations to date:

1. Bacterial studies did not seem to implicate any particular type or group of bacterial pathogens.

2. Inoculation of rabbit corneas with unfiltered washings failed to produce a keratitis which could be attributed to herpes simplex or other viruses known to be infective for this tissue.

3. Intraperitoneal and intracerebral inoculation of 4 to 6 weeks old mice with Berkefeld V filtrates of the washings failed to produce any recognizable pathological reaction or evidence of infection.

4. Inoculation of the chorio-allantois of 10 to 12 day old chick embryos with Berkefeld V filtrates of the nasopharyngeal washings produced a readily recognizable gross lesion within 48 hours. This membranal lesion has been reproduced constantly in serial passage without evidence of the presence of aerobic or anaerobic bacteria. Berkefeld V filtrates of suspensions of membranal lesions have the capacity for reproducing the lesion but indications are that much of the infectious agent is held back by the filter. Microscopic studies thus far of the membranal reaction have failed to reveal any specific characteristics. No inclusion bodies associated with many of the known viruses have been observed. It is felt that fairly good presumptive evidence has been obtained that a filter passing agent has been isolated but that its essential characteristics are as yet un-

known. That a virus differing from those which are now recognized has been isolated seems to be a distinct possibility.

Serological studies designed to demonstrate the development of specific neutralizing antibodies by comparative tests with acute and convalescent serum collected from several of the patients in this epidemic as yet are incomplete as are studies of the same type with serum from immunized laboratory animals.

FEATURES OF THE EPIDEMIC

The first case of the infection which occurred in Giles County, as far as could be ascertained, became ill on June 8, 1946, in the Milky Way Farms community. This community is located ten miles north of Pulaski, the county seat. Table 2 gives the dates of onset by

TABLE 2

Dates of Onset of Cases in an Epidemic of Meningo-encephalitis in Giles County, Tennessee, June, 1946

Week Ending	All Cases	Milky Way Community	Pigeon Roost Community	Pulaski and Surrounding Area
June 8	1	1		
15	23	19	1	3
22	36	14	8	14
29	38	5	16	16

weeks of the 96 cases which were reported and investigated during June, 1946. It may be noted that the outbreak was explosive in character. The outbreak at Milky Way preceded the outbreaks in the Pigeon Roost Creek community and in Pulaski by about one week. The Pigeon Roost Creek community is located on the highway between Pulaski and Milky Way, three miles north of Pulaski. It appears that the infection traveled rapidly along the route of travel from the Milky Way community to Pulaski, the shopping center for the county. In the Milky Way community the outbreak rapidly reached a peak and had subsided by the first week in July. From the records

of secondary cases, it is believed that the incubation period was usually 2 to 7 days.

A complete study including an investigation of all households and an enumeration of the population was made in the Milky Way community. Since attack rates could be calculated for this group, they were used as an example of the outbreak in the county. It was found that there were 137 persons living in the Milky Way community of whom 50 were white males, 38 white females, 30 colored males, and 19 colored females.

Table 3 gives the distribution of cases in the Milky Way community by age.

TABLE 3

Age Distribution of Cases in an Epidemic of Meningo-encephalitis in the Milky Way Community, Giles County, Tennessee, June, 1946

Age in Years	Population	Number of Cases	Rate per 100
Total	137	38	27.7
0-9	33	13	39.4
10-19	36	12	33.3
20-29	15	4	26.7
30-39	27	6	22.2
40-49	12	2	16.7
50-59	9		
60 and over	5	1	20.0

It may be noted that the attack rate was 28 per 100 population in the community. The exceedingly high clinical attack rate, together with probable sub-clinical infections represented by the finding of vesicular pharyngitis among many familial contacts, is evidence of a virulent infection among a non-immune population. It appears from the attack rate in this community that the infection occurred somewhat more frequently among the younger age groups. It may be noted that the attack rate was 39 per 100 population in the age group 0-9 years, 33 per 100 population in the age group 10-19 years, 27 per 100 population in the age group 20-29 years, 22 per 100 population in the age group 30-39, and 11 per 100 population in the age group 40 years and over.

In Table 4 is given the race and sex distribution of cases in the Milky Way

TABLE 4

*Sex and Race Distribution of Cases in an Epidemic of Meningo-encephalitis in the Milky Way Community, Giles County, Tennessee, June, 1946*

Sex and Race	Population	Number of Cases	Rate per 100
Total	137	38	27.7
Total White	88	31	35.2
White Males	50	15	30.0
White Females	38	16	42.1
Total Colored	49	7	14.3
Colored Males	30	4	13.3
Colored Females	19	3	15.8

community. The attack rate among the white population was more than twice the rate among the colored population. The rate among the white population was 35 per 100 and among the colored population 14 per 100. This difference was noticed also in other sections of the county, particularly in Pulaski. The attack rate among males and females appears to have been about the same.

Table 5 gives the secondary attack rates of acute meningo-encephalitis among familial contacts in the Milky Way community. In computing the secondary attack rate, all persons who

TABLE 5

*Secondary Attack Rates among Familial Contacts of Cases with an Acute Meningo-encephalitis in the Milky Way Community, Giles County, Tennessee, June, 1946*

Age in Years	Population	Number of Secondary Cases	Attack Rate per 100
Total	73	19	26.0
0-4	12	4	33.3
5-9	2	1	50.0
10-14	9	2	22.2
15-19	8	1	12.5
20 and over	42	11	26.2

had onsets more than 24 hours after the initial case or cases were counted as secondary cases. It will be noted that the secondary attack rate in this community was 26 per 100 population compared to the general attack rate of 28 per 100 population. It would appear

that the chance of obtaining the infection in the general population was as great as among familial contacts, which indicates that the infection was widespread among this non-immune population.

An investigation was made of the possible mode of transmission of the infection. A sample of the Milky Way community water supply taken during the epidemic was negative for coli-aerogenes organisms. Also, a sample obtained from a spring used as a source of water by several families in this community was negative for these organisms. In the Pigeon Roost Creek area, the sources of water were numerous, including springs, wells, and cisterns. In Pulaski, which has an approved water supply, samples obtained during the epidemic were negative for coli-aerogenes. Since numerous sources of water were used, this vehicle can be ruled out as a possible mode of transmission.

In the Milky Way community there were two milk supplies. In the Pigeon Roost Creek community and in Pulaski numerous sources were present. In the former area, most families had their own cows as a source of milk. Under these circumstances it is very unlikely that milk was a mode of transmission of the infection.

An entomological investigation was made with particular reference to flies and mosquitoes. House flies were not numerous, although they were more numerous in the Milky Way community. No *Stomoxys calcitrans* were seen. In the Milky Way community *Anopheles punctipennis* and *Culex quinquefasciatus* were numerous in natural resting places. A few larvae of *Culex apicalis* were collected in a spring. In the Pigeon Roost Creek community numerous adults of *Anopheles punctipennis* were found in natural resting places such as under bridges, under rock ledges, and in spring houses. A few *Anopheles*

*quadrinaculatus* were found in one spring house. In the City of Pulaski, a few *Anopheles punctipennis*, *Culex apicalis*, and *Culex restuans* larvae were found in inverted automobile tops in a junk yard and a few larvae of *Culex quinquefasciatus* were taken in old tires. Only in the Milky Way community were mosquitoes sufficiently numerous to cause complaints from the inhabitants. No other known arthropod vectors were found to be present in unusual numbers. Inquiry was made in the Milky Way community in regard to illness among domestic animals. No illness among such animals had occurred in recent months.

No history of common meetings such as picnics, dinners, etc., could be obtained. No food used in common by all cases investigated could be incriminated.

The explosiveness of the outbreak, the rapid spread of the infection between the Milky Way community and other parts of the county, particularly in the City of Pulaski, the repeated finding of a history of contact with other cases, the onset of multiple cases in the families in 2 to 7 days after the onset of the initial case in the family, the multiplicity of subclinical cases manifested by asymptomatic vesicular pharyngitis, and the absence of any evidence of transmission of the infection by other means, suggest that in all probability this infection was transmitted through direct contact with clinical and subclinical cases of the disease.

#### SUMMARY

A brief clinical and epidemiological description of an epidemic of an unusual disease which occurred in Giles County, Tennessee, during June and July, 1946, has been given. The authors have not been able to find in the literature a description of an infection which is similar to that which occurred in this area. Unconfirmed reports of similar

outbreaks which occurred in Louisiana, Texas, and Richmond, Va., during the summer of 1946 have come to our attention since this investigation was made.

The epidemic was explosive in character, rapidly spreading from the Milky Way community to other parts of the county and adjacent areas. The disease occurred among both sexes with about the same frequency but somewhat more frequently among the younger age groups. The attack rate among the white population was more than twice that among the colored population. Multiple cases in households was the rule, with an incubation period usually of 2 to 7 days.

The disease was characterized by sudden onset, chilly sensations, fever, severe headache, retro-bulbar pain and tenderness, photophobia, muscular pains, constipation, drowsiness, irritability, stiffness of the back and neck, vesicular pharyngitis, hyperactive reflexes, increased protein and cellular elements in the spinal fluid, with the disease of longer duration in adults, and with recovery in 2 to 10 days, without sequelae. The short incubation period and duration, mildness of the infection, and the lack of sequelae, together with absence of the typical manifestations of other known encephalitides, as St. Louis and Western equine encephalitis, apparently indicate that this may represent a new disease entity.

The evidence thus far accumulated indicates that a filterable virus is the etiological agent of this disease.

**ACKNOWLEDGMENT**—The authors wish to acknowledge the assistance of the physicians in Giles County. Without their wholehearted cooperation this study would not have been possible.

#### BIBLIOGRAPHY

1. Black, W. C. *Am. J. Dis. Child.*, 56:126, 1935.  
*J. Pediat.*, 20:145, 1942.
2. Dodd, Katherine, Buddingh, John, and Johnston, Leland. *Am. J. Dis. Child.*, 58:907, 1939.
3. Scott, T. F. McNair. *Proc. Roy. Soc. Med.*, 37:310-11, 1944.



May, 1947

# American Journal of Public Health and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 37

May, 1947

Number 5

---

## Editorial Board

REGINALD M. ATWATER, M.D.  
*Chairman and Managing Editor*

LEONA BAUMGARTNER, M.D.  
MARTIN FROBISHER, JR., D.Sc.  
PROFESSOR JOHN M. HENDERSON

RALPH S. MUCKENFUSS, M.D.  
STUART MUDD, M.D.  
RAYMOND S. PATTERSON, Ph.D.

C.-E. A. WINSLOW, Dr.P.H.

C.-E. A. WINSLOW, Dr.P.H., *Editor*

AUGUSTA JAY, *Editorial Associate*

---

## HOMER FOLKS, STATESMAN EMERITUS

THE retirement on February 18 of Homer Folks as Secretary of the State Charities Aid Association of New York State marks the end of an epoch. When Mr. Folks resigned on his eightieth birthday, he had completed 54 years of service in this post, service which has been as notable in the field of public health as in that of public welfare.

After graduation from Albion College in 1889 and Harvard in 1890, Mr. Folks became General Superintendent of the Children's Aid Society of Pennsylvania, one of the first university men to take up social work as a career. From Philadelphia, he came in 1893 to take up the position which he has resigned this spring. Early in his study of the problems of New York State, he realized the important rôle of health as a primary factor in welfare. On Mr. Folks's recommendation in 1907, the State Charities Aid Association began a movement, with the State Health Department and other agencies, for the prevention of tuberculosis in the State of New York outside of New York City. He helped to direct the organization of what rapidly became, in the judgment of competent observers, the most comprehensive and successful state campaign in this country for preventing tuberculosis. It resulted in the enactment of a number of important statutes, the establishment of a series of county tuberculosis hospitals and clinics, and the employment of a large number of public health nurses. Since 1907, the tuberculosis death rate in up-state New York has declined from 152.8 per 100,000 population to 32.8 in 1945, a reduction of 78.5 per cent. Mr. Folks was chosen President of the National Tuberculosis Association in 1912.

In 1910, the S.C.A.A. Committee on the Care of the Insane began the promotion of activities for the prevention and early recognition and treatment of mental disorders. At this time (only two years after the mental hygiene movement was launched by Clifford Beers) the name of the committee was changed to the State Committee on Mental Hygiene and it has helped to secure many improvements in the state program for dealing with the insane, including the establishment of out-patient clinics and the employment of psychiatric social workers. Mr. Folks has long been a member of the National Committee for

Mental Hygiene, with which the Association's State and City Committees on Mental Hygiene are affiliated.

In 1913, having joined the American Public Health Association in 1912, Folks entered the wider field of health administration, as a member of a Special Public Health Commission to recommend a revision of the health laws of the state. With Herman M. Biggs as Chairman and Folks as Secretary, this commission prepared a new and far-sighted program which introduced the conception of the Commissioner-Council form of state health administration. This program, which was promptly put in force, placed New York at once in the forefront of public health progress, and has since been adopted by many other states. Folks has been a member and Vice-Chairman of the New York Public Health Council since its inception and he took a prominent part in the work of the more recent Special Public Health Commission in 1930.

Mr. Folks also contributed in important degree to the development of health programs in the field of child welfare, and was President of the American Association for the Study and Prevention of Infant Mortality in 1915.

During World War I, Mr. Folks went to France in June, 1917, and organized and directed the Department of Civil Affairs of the American Red Cross Commission to France. He developed bureaus dealing with tuberculosis, child welfare, cripples, relief in the war zone, and relief of refugees throughout France. At the end of the war, Mr. Folks, then a Lieutenant Colonel of the American Red Cross, made a survey of the civilian populations of Italy, Greece, Serbia, Belgium, and France to aid the American Red Cross in planning for post-war relief. In 1921 he made another trip to eastern Europe for the American Red Cross, as a special adviser in organizing its child health work.

Between 1923 and 1930, the S.C.A.A. was the representative of the Milbank Memorial Fund in the health demonstrations in Cattaraugus County and Syracuse, undertaken for the purpose of showing what benefits could be realized by a typical rural county and a medium sized city through a more comprehensive application of scientific knowledge as to the prevention of disease and the promotion of health. Mr. Folks took an active part in these demonstrations.

Under the leadership of the State Health Department, the Association in 1926 joined a coöperative effort for the control of diphtheria in up-state New York through promoting the immunization of young children against that disease. This resulted in a 98 per cent reduction in mortality and sickness. The Association also joined in 1932, at the request of the State Health Department, the campaign for the prevention and reduction of venereal disease and the promotion of social hygiene.

Governor Hughes once said that Homer Folks was the ablest politician of his acquaintance; and it is true that the chain of local tuberculosis associations and public health associations which he built up throughout New York State was a notable example of the fact that powerful pressure groups can function in the public interest as well as in the service of some private cabal seeking special advantage. He was much more than a politician, however. He was a statesman of the public good, a wise and judicious adviser, a tireless and inspiring leader. Few persons now living have made such outstanding contributions to the cause of public health in the United States.

## BUILDING CODES AND HOUSING CODES: WHO SHOULD ENFORCE THEM

THE Building Code is a well established instrument of municipal administration. It is, as a rule, a bulky and detailed document, involving minute specifications which are sometimes out-of-date six months after they are written. Such codes generally include many provisions which make for exorbitant costs and invariably omit many conditions having a vital bearing on the health of future occupants. From the standpoint of structural safety and control of fire hazards, however, modern building codes offer ample safeguards. They are generally enforced by a building department or a tenement house department through approval of all plans for new construction, and inspection of the structures during erection.

The Housing Code, on the other hand, is a more nebulous conception. In some communities, Housing Codes have been formulated which deal with new construction as well as old and thus include a major part of the functions of the Building Code. To limit somewhat the area of chaos, we shall confine ourselves here to the consideration of those parts of a Housing Code which deal with conditions of actual occupancy. Most housing codes deal only with tenements or other multi-family structures. Housing codes that deal with all occupied dwelling units have rarely been adopted. In some cities there are no written provisions whatever and the health officer must deal with individual hazards as they come to light under the ordinary procedure for abating nuisances. A few cities, such as Baltimore and Milwaukee, have well drawn Housing Codes prepared and administered by the department of health. Sometimes, the same dwelling may be subject to inspection by representatives of the health department, the building department, the fire department, the police department and the tenement house department. In New York City, the Building Department conducts the only routine inspection with regard to occupancy conditions in tenements; and the Health Department responds only to specific nuisance complaints. Chicago has recently adopted a similar policy. Looking at the whole national situation, we see a picture best exemplified by the *New Yorker's* "Department of Utter Confusion."

This subject is discussed from the standpoint of the expert in administrative law by Charles S. Ascher in the present issue of this *Journal* and we commend his analysis to our readers.

It is a basic principle of sound administration that duplication of identical or related functions should be avoided because such duplication is wasteful of time and money and tends to confusion and lack of defined responsibility. It seems clear—as a matter of ordinary routine—that one city department and only one should be responsible for the health and safety of the inhabitants of a given occupied dwelling; and that, in practice, this ideal should be approached as closely as possible.

If such a premise be granted, it seems equally clear that the one inspector in question should be on the staff of the health department. The health officer, and he alone, has the fundamental duty of protecting the health of the individual. He alone must investigate complaints of nuisances and follow up the requests of nurses that serious hazards shall be eliminated. The most progressive health officials are recognizing that—in this field as in that of medicine—the work of the department should be preventive and not merely alleviative; and they are there-

fore undertaking routine inspections of housing conditions as they have long carried out routine inspections of food handling establishments. The health department inspector can deal with such problems as arise with regard to water supply, waste disposal, heating and sanitary facilities, occupancy and overcrowding far more intelligently than the building inspector; and he can call on the building or fire department inspector in any cases where occupancy has vitiated the safeguards established when the building was approved for construction.

A second vital reason why the health department is the one body which should carry the responsibility for occupied dwellings is that the health department alone has the prescriptive right to formulate general performance requirements instead of the rigid and minute legal specifications with which the Building Code must deal. It would seem eminently wise that—in framing such code regulations—it should consult with the building department, the fire department, the tenement house department, the police department and the zoning board; but the regulations as finally adopted should be in the broad and flexible form of the usual Sanitary Code and not involve the minute specifications of the traditional building Code.

We suggest that the Building Code for new construction may well be left as it is in the hands of the building department and its engineering specialists; but we believe that a Housing Code for occupied dwellings should be drawn up by the health department and enforced by the routine inspection service of that department, with such aid as necessary—both in drafting and enforcement—from allied departments of the city government.

The desirability of such a policy and the details of its application (including the subject matter of such a code) are now under consideration by the Association's Committee on the Hygiene of Housing; and it is hoped that a report on the subject may be available before the close of the current year.

## THE KITCHEN GARBAGE GRINDER

THE pen of the Editor has long been itching to deal with the possible future of the kitchen garbage grinder; and has been restrained only by fear of the wrath of some of our engineering friends. Useful experience has been obtained in certain Army barracks<sup>1</sup>; but war conditions have, of course, put a temporary stop to civilian developments. Now, however, the issue must again be faced; and a recent editorial in *Sewage Works Engineering* indicates that our inhibitions may after all have been unfounded.

Morris M. Cohn has this to say in the editorial in question<sup>2</sup>:

Several cities in the United States have recently been considering the economic and engineering desirability of disposing of all community garbage via the sanitary sewer system. And, thus, a new era is being born in the realm of municipal sanitation.

For the past decade, the use of home food-waste grinders has been growing gradually in some 300 municipalities, as homeowners and realty developers have purchased these household appliances and plumbed them into kitchen sink drain lines. While some 50,000 homes, representing about 200,000 persons, have eliminated garbage storage, the amount of wastes discharged to the sewer system in any one community has had no noticeable effect on the amount of wastes collected by surface methods or the character of sewage carried by the sewer system.

It is only a matter of time until some community undertakes a program of completely eliminating garbage collections and substituting disposal of ground wastes into the sanitary sewer system. Left to develop without municipal intercession, the home grinding process

will develop slowly and it will be a generation, more or less, before a major percentage of homes will use the sewer as the means of transporting their food remnants. But, if a community makes home grinding a city-sponsored project, the conversion from surface collection to underground collection and disposal may occur within a few years.

As Cohn points out, there are, of course, two aspects to such a procedure as that proposed, assuming—as we may assume in the present case—that the devices available will actually perform their task. We must ask ourselves, “What will the process accomplish for the public health?” and, “What will it cost?”

Taking up the second of these questions first, there can be no categorical or general answer. The cost of the kitchen grinding unit is at present high; but its capital cost and maintenance must be balanced against the cost of collection of garbage and its transportation to a point of final disposal. The device will involve a definite increase in domestic water consumption; and addition of ground garbage to sewage will increase the cost of disposal of the sewage since both solid content and B.O.D. will be materially increased; but this must be weighed against the cost of garbage disposal in a given locality. Taylor<sup>3</sup> has discussed the influences of the addition of ground garbage upon sludge storage capacity, sludge drying beds, and aerating. Tolman<sup>4</sup> reviews the experience of two cities which have used the procedure and concludes that one ton of garbage per one million gallons of sewage will increase B.O.D. by only 10 per cent and that sludge from sewage to which ground garbage has been added settles better than normal sewage and can be effectively digested. He estimates the additional cost of sewage treatment due to addition of ground garbage at 40 cents per ton. Both this figure and the estimate of a 10 per cent increase in B.O.D. seem extremely low.

The balance of possible economies involved must be worked out by engineers in the light of local conditions. From the standpoint of the sanitarian, there are great advantages in what Tolman calls “Dual Disposal”—even if the cost is the same or slightly greater. The storage of garbage in the vicinity of the dwelling, its transportation through the streets, and its ultimate disposal, all involve sanitary problems which can be overcome only by meticulous care at all stages of the process. The garbage pail in the kitchen, the garbage can outside the back door, the garbage truck and the dump or hog farm or garbage disposal plant are all potential sources of offensive sights and smells. If not very carefully controlled (and rare is the community where such control exists), they may breed insects and attract and foster rats and other vermin. Disposal by hog feeding may involve serious dangers of trichinosis, as it is practised in many cities.

The domestic privy was once an essential feature even of city life. It is now, in urban communities, an anachronism. We suspect that the garbage can will ultimately follow the privy along the same road.

#### REFERENCES

1. Clark, R. N., and Heifetz, A. Garbage Disposal by Grinding. *Mil. Surgeon*, 92:526 (May), 1943.
2. Cohn, M. M. Untouched by Human Hands, Editorial. *Sew. Works Eng.*, 18:147 (Mar.), 1947.
3. Taylor, H. W. About Kitchen Ground Garbage. *Am. City* 58, July, 1943, p. 58; and Aug., 1943, p. 71.
4. Tolman, S. L. Dual Disposal at Two Midwestern Cities. *Sew. Works Eng.*, 14:529 (Nov.), 1943.

## RESTAURANT SANITATION GOES SCIENTIFIC

IT is always exciting when science steps down from her academic heights to illumine the processes of daily living. A peculiarly neat and satisfying example

of this process is offered in a contribution by Mallmann and his associates published in the April issue of this *Journal*.<sup>1</sup>

In the past, our standards for the humble—but essential—task of dishwashing have been vague and confused. They are commonly based upon “immersion at least 2 minutes in clear hot water at a temperature of at least 170° F. or ½ minute in boiling water” for hand-washed dishes; but it has been recognized that, with the use of dishwashing machines, variations in general and local temperatures, in mechanical removal of dirt and in detergent effects complicate the simple standard quoted above.

Mallmann, DeKoning, and Zaikowski have developed a procedure for the accurate measurement and standardization of the actual efficiency of dishwashing procedures of any kind, which involves two distinct approaches. The Michigan investigators first devised a standard “soil,” as they call it, in the form of a mixture of water, corn-starch flour, India ink, and test bacteria which can be evenly sprayed on china dinner plates, and dried upon them so as to produce a uniform material somewhat like that resulting from the soiling of eating utensils. The test organism selected was a chromogenic coccus, *Micrococcus caseolyticus*, chosen because of the ease of recognizing its colonies on plates and its high resistance to the preliminary drying process involved. This organism is slightly more resistant to heat than *Escherichia coli* and has about the same resistance as *Streptococcus fecalis*. The “soil” is of such a nature that it is not removed by ordinary rinsing processes but can be resuspended in sterile saline solution, so that plating before and after dishwashing will give an accurate determination of the per cent reduction due to a given heat treatment.

Even more striking and ingenious than this bacteriological measuring stick, is the device worked out for direct ocular demonstration of the effectiveness of a given form of dishwasher with regard to physical removal of foreign material. Here, the investigators have prepared another type of “soil,” containing fatty materials, eggwhite, milk, etc., simulating more closely the material found on used utensils and dried on the plates under standard conditions. To observe the actual performance of a given washer, plates of this type are placed in the washer and treated according to specifications and the amount of “soil” removed in washing determined by a delicate optical instrument which records the light reflected from the plate, the greater the light reflected, the more complete being the removal of the “soil.” This device can be taken by the inspector into the field, previously-prepared “soil plates” run through the washer, and a permanent visual record obtained which is far more convincing than a statement of percentage reduction of bacteria. The facts revealed by this technique have been startling and have called attention to the fact that general water temperature alone is a very inadequate measure of actual efficiency. The interference with cleansing action, due to faulty design which interferes with the cleansing effect of local currents, is most revealing. In certain supposedly good machines, the test plate is streaked like a zebra with unremoved “soil” where bars in the apparatus protect the plate from water flow; and the demonstration of these facts is leading to radical reforms in the design of the machines. All in all, this is a remarkable demonstration of the application of refined scientific procedure to one of the most important practical tasks of sanitation.

#### REFERENCE

1. Mallmann, W. L., DeKoning, Paul, and Zaikowski, Leo. Critical Study of Machine Dishwashing. *A.J.P.H.*, 37, 4:390 (Apr.), 1947.

# Clearing House on Public Health Salary Information

The Committee on Professional Education and the Executive Board, no less than the members of the Association, have been deeply concerned with the need for adjusting salaries of public health workers to 1947 conditions. The vexing problem has been to assemble the mounting evidence of inadequate compensation and its disastrous effects into meaningful and compelling form for administrators and those to whom they must look for increased appropriations. Data about present salaries are not lacking, but they are a long way from being inclusive and conclusive. There are great gaps in the information available. Titles of positions and job descriptions are varied between one state and another to a degree that makes comparison really difficult. An exhaustive salary study seemed at first to be the only solution, but on closer examination it is obvious that, while it might improve our semantics, it could only lead to what is already common knowledge—that in many parts of the United States public health workers are now being paid sub-subsistence wages by

1947 standards; nowhere, by the same standards, are they being paid liberally; and in only a handful of individual cases are they being paid “adequately.”

Pending the availability of some full-scale salary study, the *Journal* will bring to its readers facts, information, and comment that reach it through correspondence, conversations in the field and in the central office, and experiences with our Vocational Counselling and Placement Service, and it invites readers to take part in the discussion.

Professor Winslow led off with an editorial in the April *Journal* entitled “Are our Public Health Defenses Crumbling?” He called attention to the failure of the present financial rewards in public health to hold desperately needed workers in their jobs. We follow it up with a digest of “bid and asked” prices for public health services, as we know them, in the spring months of 1947. What comes next depends upon the response from the readers and upon our success in relating bits and pieces of information from here and there to our common problem.

## Prevailing Rates of Compensation for Public Health Personnel Employed in 1947

Public health salaries have been adjusted to the rising cost of living only to a limited extent. The record shows that in many instances clerical and stenographic personnel employed by health agencies have received proportionately more liberal increases than professional persons who have been on the whole less vocal about their needs. It is apparent however that, whether

vocal or not, professional persons in public health are being drawn away from career employment in this field to take positions for which they are fitted as doctors, as engineers, as nurses, or as teachers, where the compensation level is more satisfactory than in public health. It is common knowledge that doctors and engineers often double or treble their incomes by moving from

public employment into private practice.

There were 306 public health and sanitary engineers employed by local departments of health in 1942. During the pressures of the war years perhaps a third of these persons were engaged in some form of direct war service with the Armed Forces. It is highly doubtful whether a census at the present time would show that more than 250 of this number are now in their former positions. Yet even in 1942 it was manifest that there was a clear deficit of a thousand engineers if local health departments are to be raised to even a minimum level of satisfactory performance. The newly trained engineers who are graduating from our universities find attractive positions in private employment. It may be necessary to raise current salary levels in many instances by as much as 40 or 50 per cent if we are to retain the present well experienced persons and recruit promising new personnel.

The Association offers for the information of health officers and other employers the following summary based on recent placement of a substantial number of candidates through the Vocational Counseling and Placement Service jointly operated by the American Public Health Association and the United States Public Health Service, with headquarters in the Association offices.

#### MEDICAL OFFICERS

An analysis was recently made of 48 physician candidates and 356 medical administrative or clinical openings in the Continental United States about which full information was available. Only seven of the candidates were willing to accept less than \$5,000 as a starting salary; 29 asked a minimum of at least \$6,000, and 7 asked \$7,000 or more. On the other hand, of the 356 openings more than half (210) paid a

starting salary of less than \$5,000 and only 63, or about one-sixth, paid as much as \$6,000. More than three-fourths were listed as starting below \$5,500. In terms of averages, the minimum acceptable to candidates was \$5,860, the average beginning salary for positions offered was \$4,900.

It is thus obvious that a physician with an M.P.H. degree plus field experience of at least six months can easily demand \$6,000 as a minimum entering salary. Men and women of the best quality personality have no difficulty in finding positions at \$6,500, \$7,000, and \$7,500 levels.

Even physicians without an M.P.H. but with good training and experience in some clinical specialty like tuberculosis, venereal disease, or maternal and child health are finding many openings at \$6,000, \$6,500, or \$7,000.

It is fruitless to advertise nationally medical positions at levels under \$6,000, except in circumstances under which a candidate will be provided with a stipend for training in a school of public health or other special advantages.

Even at these higher levels well qualified physicians are often receiving not more than half what they might earn on a net basis in clinical practice outside of public health. There is therefore little present incentive for the better kind of young men and women with medical degrees to go on for graduate work in public health, save for those few with a missionary zeal to whom income is a minor consideration.

#### SANITARY ENGINEERS

An analysis of 62 openings and 29 applicants for sanitary engineering positions reveals similar gaps between starting salaries offered and minima demanded by applicants. This is true in spite of the fact that the number of openings listed was only double the number of applicants, in contrast to



only one physician registered for every ten openings listed. Of the 62 positions listed, the beginning salary for 44, or nearly three-quarters, was less than \$3,600. Only 7 of the 29 candidates, on the other hand, were willing to start at salaries below \$3,600. One-half of the candidates asked for beginning salaries of \$4,000 or more; only 7 of the 62 openings were listed with starting salaries of \$4,000 or more. The average starting salary for the 62 openings was \$3,125, and the average minimum salary demanded by the 29 candidates was \$3,800.

#### STATISTICIANS

For a small group of both openings and applicants for statistical positions information was available showing the same relative spread between salaries offered and salaries demanded. Of 29 statistical openings listed, one-third offered less than \$2,600 as a starting salary; two-thirds less than \$3,600; and only three were above the \$4,000 level. Of ten applicants, on the other hand, five asked \$4,500 or more as a minimum and none was willing to accept less than \$3,000. In terms of averages, the minimum starting salary was \$3,220; the minimum figure applicants were willing to accept was \$4,090, or about one-fourth more.

#### OTHER GROUPS

Data for other groups of public health workers show the same trend but are not summarized here. The position

diversity among health educators and in laboratory personnel, for example, makes comparisons in these categories less valid than in those discussed above. However, a small group of openings for dentists and dentist applicants shows the same trend. Seven applicants asked a minimum starting salary of \$4,470, nine positions listed offered an average minimum of \$3,940. Only one applicant was willing to start at less than \$4,000; four of the openings listed were at this figure. No opening listed had a maximum figure of \$6,000; one applicant asked this figure as a starting salary; two others with a lower minimum hoped to secure \$6,000 openings. In interpreting these figures it must be remembered that for many reasons the needs of the employing agencies are not always matched by the applicant's desires or abilities, and *vice versa*.

Experience indicates the need for a concerted attack on low salaries in public health. The energy that is spent on raising salary standards now will do more to raise the standard of public health service than anything else that can be done. Indeed, unless efforts to raise salary standards parallel those to raise qualification standards, the latter effort will be largely nullified. That has been amply proved by the public school teacher crisis, as a result of which teachers with substandard certificates have multiplied rapidly in spite of rising standards of certification.

# American Public Health Association

## SECTION COUNCILS

1946-1947

### Dental Health Section

(Organized 1943)

- Walter J. Pelton, D.D.S., *Chairman*, U. S. Public Health Service, Denver, Colo.  
Frances A. Stoll, *Vice-Chairman*, 630 West 168th Street, New York, N. Y.  
Lester A. Gerlach, D.D.S., *Secretary*, City Health Department, Milwaukee, Wis.  
Thomas W. Clune, D.M.D. (1951)  
Allen O. Gruebbel, D.D.S. (1950)  
Kenneth A. Easlick, D.D.S. (1949)  
C. R. Taylor, D.D.S. (1948)  
George A. Nevitt, D.D.S. (1947)

### Engineering Section

(Organized 1911)

- W. Scott Johnson, *Chairman*, State Board of Health, Jefferson City, Mo.  
John M. Hepler, C.E., *Vice-Chairman*, State Department of Health, Lansing, Mich.  
George O. Pierce, *Secretary*, University of Minnesota, Minneapolis, Minn.  
Ernest G. Eggert (1951)  
Alfred H. Fletcher (1950)  
Sol Pincus, C.E. (1949)  
A. H. Wieters (1948)  
J. Lloyd Barron, C.E. (1947)

### Epidemiology Section

(Organized 1929)

- James E. Perkins, M.D., *Chairman*, State Department of Health, Albany, N. Y.  
Robert D. Defries, M.D., *Vice-Chairman*, University of Toronto, Toronto, Ont.  
Franklin H. Top, M.D., *Secretary*, Herman Kiefer Hospital, Detroit, Mich.  
Herman E. Hilleboe, M.D. (1951)  
Charles E. Smith, M.D. (1950)  
Carl C. Dauer, M.D. (1949)  
John J. Phair, M.D. (1948)  
Kenneth F. Maxcy, M.D. (1947)

### Food and Nutrition Section

(Organized 1917)

- Charles G. King, Ph.D., *Chairman*, Nutrition Foundation, New York, N. Y.  
Marjorie M. Heseltine, *Vice-Chairman*, U. S. Children's Bureau, Washington, D. C.  
Alice H. Smith, *Secretary*, U. S. Children's Bureau, San Francisco, Calif.

Marietta Eichelberger, Ph.D. (1951)

Margaret C. Moore (1950)

Donald K. Tressler, Ph.D. (1949)

Paul S. Prickett, Ph.D. (1948)

Carl S. Pederson, Ph.D. (1947)

### Health Officers Section

(Organized 1908)

- Richard F. Boyd, M.D., *Chairman*, State Department of Public Health, Springfield, Ill.  
Millard Winchester, M.D., *Vice-Chairman*, Commissioner of Health, Glynn County, Brunswick, Ga.  
Joseph Molner, M.D., *Secretary*, City Department of Health, Detroit, Mich.  
Carl N. Neupert, M.D. (1951)  
Emil E. Palmquist, M.D. (1950)  
Joseph H. Kinnaman, M.D. (1949)  
Malcolm R. Bow, M.D. (1948)  
E. R. Coffey, M.D. (1947)

### Industrial Hygiene Section

(Organized 1914)

- Helmuth H. Shrenk, Ph.D., *Chairman*, U. S. Bureau of Mines, Pittsburgh, Pa.  
Carl M. Peterson, M.D., *Vice-Chairman*, 535 N. Dearborn Street, Chicago, Ill.  
Richard T. Page, *Secretary*, U. S. Public Health Service, Kansas City, Mo.  
T. Lyle Hazlett, M.D. (1951)  
Kenneth M. Morse (1950)  
Herbert G. Dyktor (1949)  
James G. Townsend, M.D. (1948)  
J. J. Bloomfield (1947)

### Laboratory Section

(Organized 1899)

- Sara E. Branham, M.D., *Chairman*, National Institute of Health, Bethesda, Md.  
Edmund K. Kline, Dr.P.H., *Vice-Chairman*, Cattaraugus County Department of Health, Olean, N. Y.  
Geoffrey Edsall, M.D., *Secretary*, Division of Biologic Laboratories, Boston, Mass.  
Walter L. Mallmann, Ph.D. (1951)  
John F. Mahoney, M.D. (1950)  
C. A. Perry, Sc.D. (1949)  
Pearl L. Kendrick, Sc.D. (1948)  
James Gibbard (1947)

## Maternal and Child Health Section

(Organized 1921)

- Viktor O. Wilson, M.D., *Chairman*, Department of Health, Minneapolis, Minn.  
 Martha L. Clifford, M.D., *Vice-Chairman*, State Health Department, Hartford, Conn.  
 Myron E. Wegman, M.D., *Secretary*, Louisiana State University, New Orleans, La.  
 Francis V. Corrigan, M.D. (1951)  
 Paul R. Ensign, M.D. (1950)  
 Ruth J. Raattama, M.D. (1949)  
 William M. Schmidt, M.D. (1948)  
 Hilla Sheriff, M.D. (1947)

## Public Health Education Section

(Organized 1922)

- Mabel E. Rugen, Ph.D., *Chairman*, University of Michigan, Ann Arbor, Mich.  
 Ann W. Haynes, *Vice-Chairman*, State Department of Public Health, San Francisco, Calif.  
 Reba F. Harris, *Secretary*, Volusia County Health Department, Daytona Beach, Fla.  
 Eunice N. Tyler, Ph.D. (1951)  
 Lewis C. Robbins, M.D. (1950)  
 Alice M. Johnson (1949)  
 Bess Exton (1948)  
 J. Louis Neff (1947)

## Public Health Nursing Section

(Organized 1923)

- Mary C. Connor, R.N., *Chairman*, 1790 Broadway, New York, N. Y.  
 Josephine L. Daniel, R.N., *Vice-Chairman*, State Board of Health, Oklahoma City, Okla.

- Rosalie I. Peterson, R.N., *Secretary*, U. S. Public Health Service, Washington, D. C.  
 Helene B. Buker, R.N. (1951)  
 Elizabeth L. Smellie, R.N. (1950)  
 Marion H. Douglas, R.N. (1949)  
 Mary D. Forbes, R.N. (1948)  
 Dorothy Deming, R.N. (1947)

## School Health Section

(Organized 1942)

- George M. Wheatley, M.D., *Chairman*, One Madison Avenue, New York, N. Y.  
 Ruth E. Grout, Ph.D., *Vice-Chairman*, University of Minnesota, Minneapolis, Minn.  
 S. S. Lifson, *Secretary*, U. S. Public Health Service, New York, N. Y.  
 Leona Baumgartner, M.D. (1951)  
 A. O. DeWeese, M.D. (1950)  
 C. L. Outland, M.D. (1949)  
 Nina B. Lamkin (1948)  
 Mary E. Chayer, R.N. (1947)

## Vital Statistics Section

(Organized 1908)

- Ruth R. Puffer, Dr.P.H., *Chairman*, State Health Department, Nashville, Tenn.  
 Forrest E. Linder, Ph.D., *Vice-Chairman*, Bureau of Census, Washington, D. C.  
 Clara E. Councell, *Secretary*, Institute of Inter-American Affairs, Washington, D. C.  
 Paul M. Densen, D.Sc. (1951)  
 Robert G. Webster (1950)  
 Alan E. Treloar, Ph.D. (1949)  
 John T. Marshall (1948)  
 Richard N. Whitfield, M.D. (1947)

## THE ASSOCIATION COMMITTEE LISTS

These pages again bring to the readers the lists of Association officers and Committee members. Once again they make a goodly company representing altogether more than 150 committees and other councils, a capable and loyal group of workers.

A certain proportion of the names of those formerly carried on such lists do not appear here. They have the Association's thanks for work well done in other years and for the fine spirit in which they have recognized the fact that, for the sake of the Association and its future effectiveness, leadership must be shared and leaders constantly developed through the assumption of responsibility. Our Association is stronger today because leaders

periodically have stepped aside in order that others may step forward to acquire such knowledge as they themselves have gained.

Change in leadership is becoming an accepted policy in the Association. Such a professional society is never strong if an informed few lead many uninformed though loyal followers. A strong association is composed of leaders many of whom could at any time take their turn and lead.

As we gratefully acknowledge the debt to those who have rendered their service as they carried their responsibilities of office, we turn with hope and expectation of other achievements to the men and women who are now to lead.

# American Public Health Association

## Committees

1946-1947

### Committee on Administrative Practice

Wilton L. Halverson, M.D., *Chairman*, State Department of Public Health, San Francisco, Calif. (1947)

Haven Emerson, M.D., *Vice-Chairman* (1949)

Reginald M. Atwater, M.D., *Secretary*, 1790 Broadway, New York, N. Y.

Gregoire F. Amyot, M.D. (1947) Representing the Health Officers Section

Richard F. Boyd, M.D. (1949)

Leroy E. Burney, M.D. (1947) Representing the Health Officers Section

Harry L. Chant, M.D. (1950)

George B. Darling, Dr.P.H. (1950)

V. L. Ellicott, M.D. (1947) Representing the Health Officers Section

Thomas Francis, Jr., M.D., *Chairman*, Committee on Research and Standards (*ex officio*)

Ira V. Hiscock, Sc.D. (1947)

Robert H. Hutcheson, M.D. (1948)

Joseph W. Mountin, M.D. (1950)

John T. Phair, M.B. (1948)

Clarence L. Scamman, M.D. (1948)

Marion W. Sheahan, R.N. (1947)

H. A. Whittaker (1949),

#### Consultants:

Henry F. Vaughan, Dr.P.H.

C.-E. A. Winslow, Dr.P.H.

Paul F. Stricker

Robert J. Vane, Representing Vital Statistics Section

#### Staff

Carl E. Buck, Dr.P.H., *Senior Field Director*

Edith M. Boyd, *Associate Secretary*

#### Executive Committee

Wilton L. Halverson, M.D., *Chairman*, State Department of Public Health, San Francisco, Calif.

Reginald M. Atwater, M.D.

George B. Darling, Dr.P.H.

Haven Emerson, M.D.

Joseph W. Mountin, M.D.

#### Subcommittee on Accident Prevention

Donald B. Armstrong, M.D., *Chairman*, One Madison Avenue, New York, N. Y.

W. W. Bauer, M.D.

Donald A. Dukelow, M.D.

Halbert L. Dunn, M.D., Representing Vital Statistics Section

Thomas Fansler

F. Ruth Kahl, R.N.

H. E. Kleinschmidt, M.D.

Elisabeth C. Phillips, R.N.

Edward S. Rogers, M.D.

Ernest L. Stebbins, M.D.

#### Subcommittee on Evaluation of Administrative Practices

Haven Emerson, M.D., *Chairman*, 600 West 168th Street, New York, N. Y.

Dwight M. Bissell, M.D.

Bruce H. Douglas, M.D.

Allen W. Freeman, M.D.

Joseph W. Mountin, M.D.

#### Diphtheria

W. E. Bunney, Ph.D., *Secretary*, 745 Fifth Ave., New York, N. Y.

Frank A. Calderone, M.D.

James A. Doull, M.D.

Donald T. Fraser, M.B., D.P.H.

Martin Frobisher, Jr., Sc.D.

D. Gordon Gill, M.B., D.P.H.

Edward S. Godfrey, Jr., M.D., *Referee*

William Grossman, M.D.

W. T. Harrison, M.D.

G. Foard McGinnes, M.D.

Erich Seligmann, M.D.

Ernest L. Stebbins, M.D.

J. T. Tripp, Ph.D.

V. K. Volk, M.D.

*Endemic Goiter*

O. P. Kimball, M.D., *Secretary*, Hanna Building, Cleveland, Ohio  
 George M. Curtis, M.D.  
 E. B. Hart, Ph.D.  
 Roy Donaldson McClure, M.D.  
 William H. Sebrell, Jr., M.D., *Referee*  
 Harry A. Towsley, M.D.  
 W. G. Wilcox, Ph.D.

*Consultants:*

David Marine, M.D.  
 E. M. Nelson, Ph.D.  
 Russell M. Wilder, M.D.

*Vaccination Against Influenza*

Thomas Francis, M.D., *Chairman*, University of Michigan, Ann Arbor, Mich.  
 Vlado A. Getting, M.D.  
 Bettylee Hampil, Sc.D.  
 George K. Hirst, M.D.  
 James P. Leake, M.D.  
 Wilson G. Smillie, M.D.

*Measles*

Franklin H. Top, M.D., *Secretary*, Herman Kiefer Hospital, Detroit, Mich.  
 James P. Leake, M.D., *Referee*  
 A. Clement Silverman, M.D.

*Multiple Antigens*

W. E. Bunney, Ph.D., *Secretary*, 745 Fifth Ave., New York, N. Y.  
 Donald T. Fraser, M.B., D.P.H.  
 Pearl L. Kendrick, Sc.D.  
 Franklin H. Top, M.D.  
 Milton V. Veldee, M.D.  
 V. K. Volk, M.D.

*Scarlet Fever*

Franklin H. Top, M.D., *Secretary*, Herman Kiefer Hospital, Detroit, Mich.  
 Gaylord W. Anderson, M.D.  
 LeRoy D. Fothergill, M.D.  
 Donald T. Fraser, M.B., D.P.H.  
 John R. Paul, M.D.  
 James E. Perkins, M.D.  
 Milton V. Veldee, M.D., *Consultant*  
 Stafford M. Wheeler, M.D.

*Tuberculosis Control Procedures*

Bruce H. Douglas, M.D., *Secretary*, Commissioner of Health, Detroit, Mich.  
 Herbert R. Edwards, M.D.  
 Kendall Emerson, M.D.  
 Herman E. Hilleboe, M.D.  
 Esmond R. Long, M.D., *Consultant*  
 C. R. Reynolds, M.D.

Marion W. Sheahan, R.N.  
 George J. Wherrett, M.D.

*Typhoid Fever*

Roy F. Feemster, M.D., *Secretary*, Room 519, State House, Boston, Mass.  
 Gaylord W. Anderson, M.D.  
 Don M. Griswold, M.D.  
 Albert V. Hardy, M.D.  
 George F. Luippold  
 Kenneth F. Maxcy, M.D., *Referee*  
 Orianna McDaniel, M.D.

*Whooping Cough*

James A. Doull, M.D., *Secretary*, U. S. Public Health Service, Washington, D. C.  
 Joseph A. Bell, M.D.  
 F. L. Kelly, M.D.  
 Pearl L. Kendrick, Sc.D.  
 George McL. Lawson, M.D.  
 J. J. Miller, M.D.

*Subcommittee on Local Health Units*

Haven Emerson, M.D., *Chairman*, 600 West 168th Street, New York, N. Y.  
 Burton F. Austin, M.D.  
 Richard F. Boyd, M.D.  
 A. J. Chesley, M.D.  
 J. Roy Hege, M.D.  
 Hugh R. Leavell, M.D.  
 Joseph W. Mountin, M.D.  
 George H. Ramsey, M.D.  
 Nathan Sinai, Dr.P.H.

*Consultants:*

John A. Ferrell, M.D.  
 Clarence L. Scamman, M.D.

*Subcommittee on Medical Care*

Joseph W. Mountin, M.D., *Chairman*, U. S. Public Health Service, Washington, D. C.  
 Dean A. Clark, M.D.  
 Edwin F. Daily, M.D.  
 V. L. Ellicott, M.D.  
 Isidore S. Falk, Ph.D.  
 Vlado A. Getting, M.D.  
 John B. Grant, M.D., *Consultant*  
 J. Roy Hege, M.D.  
 Fred W. Jackson, M.D.  
 Hugh R. Leavell, M.D.  
 Basil MacLean, M.D.  
 Hugh Morgan, M.D.  
 Marian G. Randall, R.N.  
 Dean W. Roberts, M.D.  
 Edward S. Rogers, M.D.  
 Nathan Sinai, Dr.P.H.  
 R. M. Walls, D.D.S.

Staff: P. O. Box 5998, Bethesda, Md.

Howard M. Kline, Ph.D., *Technical Secretary*

Milton Terris, M.D., *Medical Associate*

Cozette Hapney, *Research Associate*

#### Subcommittee on Public Health Nursing

Marie L. Johnson, R.N., *Chairman*, One Madison Avenue, New York, N. Y.

Alice F. Brackett, R.N.

Carl E. Buck, Dr.P.H.

Christine Causey, R.N.

Jean Downes

Virginia B. Elliman, R.N.

Ruth Fisher, R.N.

Hortense Hilbert, R.N.

Ruth Houlton, R.N.

Ruth W. Hubbard, R.N.

Margaret C. Klem

Marie M. Knowles, R.N.

Joseph I. Linde, M.D.

Rosalie I. Peterson, R.N.

Emilie G. Sargent, R.N.

Pearl R. Shalit, R.N.

Marion W. Sheahan, R.N.

Nathan Sinai, Dr.P.H.

Mrs. Richard K. Stevens

Ruth E. TeLinde, R.N.

Dorothy Wiesner

#### Subcommittee on State and Local Health Administration

Ira V. Hiscock, Sc.D., *Co-Chairman*, Yale University School of Medicine, New Haven, Conn.

George B. Darling, Dr.P.H., *Co-Chairman*, Yale University, New Haven, Conn.

Gregoire F. Amyot, M.D.

Floyd C. Beelman, M.D.

Roland R. Cross, M.D.

Martha M. Eliot, M.D.

Vlado A. Getting, M.D.

Roscoe P. Kandle, M.D.

Joseph W. Mountin, M.D.

George T. Palmer, Dr.P.H.

Carolina R. Randolph

Hugh B. Robins, M.D.

Clarence L. Scamman, M.D.

John W. Shackelford, M.D.

Felix J. Underwood, M.D.

Henry F. Vaughan, Dr.P.H., *Consultant*

#### Study Committee on Sanitation

H. A. Whittaker, *Chairman*, University of Minnesota, Minneapolis, Minn.

Herbert J. Dunsmore

Alfred H. Fletcher

H. A. Kroeze, C.E.

Erminie Cross Lacey

Arthur P. Miller, C.E.

Roy J. Morton

#### Subcommittee on Reciprocal Sanitary Milk Control

Walter D. Tiedeman, M.C.E., *Chairman*, State Department of Health, Albany, N. Y.

A. W. Fuchs, C.E.

Leland Spencer, Ph.D.

John Taylor

K. G. Weckel, Ph.D.

Israel Weinstein, M.D.

Huntington Williams, M.D.

### Committee on Eligibility

Vlado A. Getting, M.D., *Chairman*, State Department of Health, Boston, Mass.

Reginald M. Atwater, M.D., *Secretary*, 1790 Broadway, New York, N. Y.

J. Thomas Fulton, D.D.S., Dental Health Section (1948)

James Gibbard, Laboratory Section (1948)

Ira V. Hiscock, Sc.D., Public Health Education Section (1948)

Marion Hotopp, M.D., Maternal and Child Health Section (1947)

William L. Hughes, Ph.D., School Health Section (1947)

Charles F. McKhann, Jr., M.D., Epidemiology Section (1948)

Roy J. Morton, Engineering Section (1948)

Ole Salthe, Food and Nutrition Section (1948)

William H. F. Warthen, M.D., Health Officers Section (1947)

John H. Watkins, Ph.D., Vital Statistics Section (1947)

Alberta B. Wilson, R.N., Public Health Nursing Section (1947)

William P. Yant, Industrial Hygiene Section (1947)

Elsie A. Siemer, *Associate Secretary*

## Committee on Professional Education

William P. Shepard, M.D., *Chairman*, 600 Stockton Street, San Francisco, Calif. (1947)  
 Reginald M. Atwater, M.D., *Secretary*, 1790 Broadway, New York, N. Y.  
 Gaylord W. Anderson, M.D. (1947)  
 W. W. Bauer, M.D. (1947)  
 Robert D. Defries, M.D. (1948)  
 Ella E. McNeil, R.N. (1949)  
 Hugo Muench, M.D. (1949)  
 Wilson G. Smillie, M.D. (1949)  
 Ernest L. Stebbins, M.D. (1948)  
 Ralph E. Tarbett, C.E. (1947)  
 Clair E. Turner, Dr.P.H. (1948)  
 V. A. Van Volkenburgh, M.D. (1948)  
 Huntington Williams, M.D. (1949)

### Consultants:

Edward S. Godfrey, Jr., M.D.  
 George H. Ramsey, M.D.  
 Lowell J. Reed, Ph.D.  
 C.-E. A. Winslow, Dr.P.H.

### Editorial Committee

William P. Shepard, M.D., *Chairman*, 600 Stockton Street, San Francisco, Calif.  
 George H. Ramsey, M.D.  
 Wilson G. Smillie, M.D.

### Educational Qualifications of Executives of Voluntary Health Agencies

Reginald M. Atwater, M.D., *Referee*, 1790 Broadway, New York, N. Y.

### Educational Qualifications of Health Officers

Ernest L. Stebbins, M.D., *Referee*, The Johns Hopkins University, Baltimore, Md.

### Educational Qualifications of Public Health Engineers

Ralph E. Tarbett, C.E., *Referee*, 407 Carroll Avenue, Takoma Park, Md.

### Educational Qualifications of Public Health Laboratory Personnel

Reginald M. Atwater, M.D., *Referee*, 1790 Broadway, New York, N. Y.

### Educational Qualifications of Public Health Nurses

Ella E. McNeil, R.N., *Referee*, University of Michigan, Ann Arbor, Mich.

### Educational Qualifications of Public Health Nutritionists

Ella E. McNeil, R.N., *Referee*, University of Michigan, Ann Arbor, Mich.

### Educational Qualifications of School Physicians

William P. Shepard, M.D., *Referee*, 600 Stockton Street, San Francisco, Calif.

### Joint Committee of the Engineers' Council for Professional Development and the A.P.H.A.

Abel Wolman, Dr.Eng., *Chairman*, The Johns Hopkins University, Baltimore, Md.

### E.C.P.D. Representatives:

Sidney Withington  
 Gordon M. Fair

### A.P.H.A. Representatives:

M. Allen Pond  
 C.-E. A. Winslow, Dr.P.H.

### Subcommittee on Education of Undergraduates in Preventive Medicine and Public Health

Wilson G. Smillie, M.D., *Referee*, Cornell University Medical College, New York, N. Y.

### Subcommittee on Educational Qualifications of Cancer Control Administrators

Edward S. Godfrey, Jr., M.D., *Referee*, State Department of Health, Albany, N. Y.

### Subcommittee on Educational Qualifications of Communicable Disease Control Officers

George H. Ramsey, M.D., *Referee*, University Hospital, Ann Arbor, Mich.

### Subcommittee on Educational Qualifications of Dental Hygienists

Personnel to be appointed

**Subcommittee on Educational Qualifications of Health Educators**

Clair E. Turner, Dr.P.H., *Chairman-Referee*,  
National Foundation for Infantile Paralysis,  
New York, N. Y.  
Mary P. Connolly  
Mayhew Derryberry, Ph.D.  
Ruth E. Grout, Ph.D.  
Ira V. Hiscock, Sc.D.  
Lucy Morgan, Ph.D.  
Warren H. Southworth, Dr.P.H.  
Felix J. Underwood, M.D.

**Subcommittee on Educational Qualifications of Industrial Hygienists**

Clarence D. Selby, M.D., *Chairman*, 3044  
W. Grand Boulevard, Detroit, Mich.  
William P. Shepard, M.D., *Referee*, 600  
Stockton Street, San Francisco, Calif.  
Leverett D. Bristol, M.D.  
Philip Drinker  
T. Lyle Hazlett, M.D.  
Paul A. Neal, M.D.  
Carl M. Peterson, M.D.

**Subcommittee on Educational Qualifications of Maternal and Child Health Administrators**

Edwin F. Daily, *Chairman*, U. S. Children's  
Bureau, Washington, D. C.  
Wilson G. Smillie, M.D., *Referee*, Cornell  
University Medical College, New York,  
N. Y.  
Martha L. Clifford, M.D.  
Albert D. Kaiser, M.D.

**Subcommittee on Educational Qualifications of Mental Hygiene Administrators**

James M. Cunningham, M.D., *Chairman*,  
State Department of Health, Hartford,  
Conn.  
W. W. Bauer, M.D., *Referee*, 535 N. Dear-  
born Street, Chicago, Ill.  
Clara Bassett  
Franklin G. Ebaugh, M.D.  
Milton J. E. Senn, M.D.  
Charles E. Shepard, M.D.  
George S. Stevenson, M.D.

**Subcommittee on Educational Qualifications of Personnel in Vital Statistics and Vital Records**

W. Thurber Fales, Sc.D., *Chairman*, City  
Health Department, Baltimore, Md.  
Lowell J. Reed, Ph.D., *Referee*, The Johns  
Hopkins University, Baltimore, Md.  
Earle G. Brown, M.D.  
Antonio Ciocco  
Hugo Muench, M.D.  
Robert G. Webster

**Subcommittee on Educational Qualifications of Sanitarians**

Walter S. Mangold, *Chairman*, University  
of California, Berkeley, Calif.  
William P. Shepard, M.D., *Referee*, 600  
Stockton Street, San Francisco, Calif.  
Dwight M. Bissell, M.D.  
Thomas M. McMorrow  
E. A. Reinke

**Subcommittee on Field Training of Public Health Personnel**

Gaylord W. Anderson, M.D., *Chairman*,  
University of Minnesota, Minneapolis,  
Minn.  
Benjamin G. Horning, M.D.  
Edward G. McGavran, M.D.  
Pearl McIver, R.N.  
Roy J. Morton  
Wilson G. Smillie, M.D.

*Consultants:*

Edward S. Godfrey, Jr., M.D.  
John E. Gordon, M.D.

**Subcommittee on Personnel Administration**

L. E. Burney, M.D., *Chairman*, State Board  
of Health, Indianapolis, Ind.  
(Personnel to be appointed)

**Subcommittee on Salary Study**

William R. Willard, M.D., *Chairman*, Yale  
University, New Haven, Conn.  
Richard F. Boyd, M.D.  
Harold F. Dorn  
M. R. Kinde, M.D.  
M. Allen Pond  
Wilson T. Sowder, M.D.  
Ernest L. Stebbins, M.D.  
V. A. Van Valkenburgh, M.D.  
Alberta B. Wilson, R.N.



## Committee on Research and Standards

Thomas Francis, Jr., M.D., *Chairman*, University of Michigan, Ann Arbor, Mich.

Reginald M. Atwater, M.D., *Secretary*, 1790 Broadway, New York, N. Y.

J. J. Bloomfield (1947)

Alfred G. Burgdorf, M.D. (1949)

Halbert L. Dunn, M.D. (1948)

Haven Emerson, M.D. (1947)

Gordon M. Fair (1948)

W. W. Frye, M.D. (1948)

James Gibbard (1949)

Wilton L. Halverson, M.D., *Chairman*, Committee on Administrative Practice (*ex officio*)

Friend Lee Mickle, Sc.D. (1949)

John F. Norton, Ph.D. (1949)

Elliott S. Robinson, M.D. (1947)

Thomas F. Sellers, M.D. (1947)

Fred W. Tanner, Ph.D. (1947)

Walter D. Tiedeman (1948)

### *Consultant:*

Abel Wolman, Dr.Eng.

### Subcommittee on Autopsies

Haven Emerson, M.D., *Chairman*, 600 West 168th Street, New York, N. Y.

George C. Dunham, M.D.

W. Thurber Fales, Sc.D.

Harrison S. Martland, M.D.

Paul D. Rosahn, M.D.

Milton C. Winternitz, M.D.

### Subcommittee on Communicable Disease Control

Haven Emerson, M.D., *Chairman*, 600 West 168th Street, New York, N. Y.

Gaylord W. Anderson, M.D.

Captain T. J. Carter, M.C., USN

L. T. Coggeshall, M.D.

James A. Doull, M.D.

John E. Gordon, M.D.

James P. Leake, M.D.

Kenneth F. Maxcy, M.D.

Alton S. Pope, M.D.

George H. Ramsey, M.D.

Ernest L. Stebbins, M.D.

### Subcommittee for the Evaluation of Methods to Control Air-borne Infections

James E. Perkins, M.D., *Chairman*, State Department of Health, Albany, N. Y.

F. W. Gilcreas

Alexander Hollaender, Ph.D.

Alexander D. Langmuir, M.D., *Secretary*

O. H. Robertson, M.D.

William F. Wells

George M. Wheatley, M.D.

C. P. Yaglou

### Subcommittee on Food Utensil Sanitation

Walter D. Tiedeman, M.C.E., *Chairman*, State Department of Health, Albany, N. Y.

A. W. Fuchs, C.E.

N. O. Gunderson, M.D.

George J. Hucker, Ph.D.

Walter L. Mallmann, Ph.D.

### Subcommittee on the Hygiene of Housing

C.-E. A. Winslow, Dr.P.H., *Chairman*, 333 Cedar Street, New Haven, Conn.

Frederick J. Adams

Charles S. Ascher

Rollo H. Britten

F. Stuart Chapin, Ph.D.

Henry S. Churchill

Robert L. Davison

Clarence W. Farrier

Alfred H. Fletcher

L. M. Graves, M.D.

E. R. Krumbiegel, M.D.

Bleecker Marquette

Robert B. Mitchell

M. Allen Pond

F. Carlyle Roberts, Jr.

Mary Rokahr

Abner D. Silverman

Donald Y. Solandt, M.D.

Howard P. Vermilya

H. A. Whittaker

Huntington Williams, M.D.

Sidney J. Williams

Coleman Woodbury

Henry Wright

Staff: 310 Cedar Street, New Haven, Conn.

Allan A. Twichell, *Technical Secretary*

Anatole A. Solow, *Research Associate*

Ann S. Copperman, *Research Associate*

Emil A. Tiboni, *Field Secretary*

Rose Olanik, *Assistant Secretary*

### Subcommittee on Administration of Housing Regulations

Charles S. Ascher, *Chairman*, 2 Park Avenue, New York, N. Y.

*Subcommittee on Research*

M. Allen Pond, *Chairman*, 310 Cedar Street, New Haven, Conn.

*Subcommittee on Standards for Construction and Fundamental Equipment*

Henry S. Churchill, *Chairman*, 56 West 45th Street, New York, N. Y.

*Subcommittee on Standards for Installed Household Equipment*

Mary Rokahr, *Chairman*, U. S. Department of Agriculture, Washington, D. C.

*Subcommittee on Standards for Space Design and Occupancy*

Abner D. Silverman, *Chairman*, Federal Public Housing Authority, Washington, D. C.

*Subcommittee on Substance of Housing Regulations*

E. R. Krumbiegel, M.D., *Chairman*, Department of Health, Milwaukee, Wis.

*Subcommittee on Morbidity Registration and Statistics*

Lowell J. Reed, Ph.D., *Chairman*, The Johns Hopkins University, Baltimore, Md.

Gaylord W. Anderson, M.D.

Edwin L. Crosby, M.D.

W. Thurber Fales, Sc.D.

James P. Leake, M.D.

Franklin H. Top, M.D.

Ellen B. Whiteman

## Association Committees

*Committee on Constitution and By-Laws*

Edward S. Godfrey, Jr., M.D., *Chairman*, State Department of Health, Albany, N. Y.

Haven Emerson, M.D.

Franklin M. Foote, M.D.

Charles E. Shepard, M.D.

*Lasker Awards Committee*

George Bachr, M.D., *Chairman*, One East 100th Street, New York, N. Y.

Francis G. Blake, M.D.

R. E. Dyer, M.D.

Thomas Francis, Jr., M.D.

Charles G. King, Ph.D.

Hugh R. Leavell, M.D.

Robert F. Loeb, M.D.

Karl F. Meyer, Ph.D.

James S. Simmons, M.D.

Ernest L. Stebbins, M.D.

Abel Wolman, Dr.Eng.

*Editorial Board*

Reginald M. Atwater, M.D., *Chairman*, 1790 Broadway, New York, N. Y.

Leona Baumgartner, M.D.

Martin Frobisher, Jr., D.Sc.

John M. Henderson

Ralph S. Muckenfuss, M.D.

Stuart Mudd, M.D.

Raymond S. Patterson, Ph.D.

C.-E. A. Winslow, Dr.P.H.

*Nominating Committee for Governing Council Members*

Earle G. Brown, M.D., *Chairman*, Nassau County Dept. of Health, Mineola, N. Y.

Lloyd M. Graves, M.D., Health Officers Section

Myrtle Greenfield, Laboratory Section

Hugo Muench, M.D., Vital Statistics Section

Arthur E. Gorman, Engineering Section

C. O. Sappington, M.D., Industrial Hygiene Section

Marietta Eichelberger, Ph.D., Food and Nutrition Section

John M. Saunders, M.D., Maternal and Child Health Section

Howard W. Lundy, Dr.P.H., Public Health Education Section

Pearl McIver, R.N., Public Health Nursing Section

Alexander G. Gilliam, M.D., Epidemiology Section

David Van der Slice, M.D., School Health Section

Frank C. Cady, D.D.S., Dental Health Section

*Joint Committee on Housing and Health (Joint with the National Association of Housing Officials)*

Bleecker Marquette, *Chairman*, 312 West 9th Street, Cincinnati, Ohio

*A.P.H.A.*

Rollo H. Britten

Alfred H. Burgdorf, M.D.

C. V. Craster, M.D.

L. M. Graves, M.D.

Huntington Williams, M.D.

*N.A.H.O.*

Charles S. Ascher

Henry S. Churchill

Paul B. Cornely, M.D.

Harold J. Dillehay

Clarence W. Farrier

Alfred H. Fletcher

B. M. Pettit

**Program Committee**

Reginald M. Atwater, M.D., *Chairman*,  
1790 Broadway, New York, N. Y.  
Carl E. Buck, Dr.P.H.  
Clara E. Councell  
Geoffrey Edsall, M.D.  
Franklin M. Foote, M.D.  
Lester A. Gerlach, D.D.S.  
Reba F. Harris  
Theodore G. Klumpp, M.D.  
S. S. Lifson  
J. Lynn Mahaffey, M.D.  
Joseph G. Molner, M.D.  
Richard T. Page  
Rosalie I. Peterson, R.N.  
George O. Pierce  
David E. Price, M.D.  
Samuel L. Salasin, M.D.  
Alice H. Smith  
Franklin H. Top, M.D.  
V. A. Van Volkenburgh, M.D.  
Myron E. Wegman, M.D.  
C.-E. A. Winslow, Dr.P.H.

**Scientific Exhibits Committee**

Franklin M. Foote, M.D., *Chairman*, 1790  
Broadway, New York, N. Y.  
Paul H. Brown, M.D.  
Homer N. Calver  
Vivian Drenckhahn  
Francis B. Elder  
Horace Hughes  
S. S. Lifson  
Willimina R. Walsh

**Sedgwick Memorial Medal Committee**

James S. Simmons, M.D., *Chairman*, Har-  
vard University, Boston, Mass.  
Thomas Francis, Jr., M.D.  
Wilton L. Halverson, M.D.  
Karl F. Meyer, M.D.  
Harry S. Mustard, M.D.  
William P. Shepard, M.D.  
Abel Wolman, Dr.Eng.

## Section Committees

### Dental Health Section

**Membership Committee**

Olin E. Hoffman, D.D.S., *Chairman*, 1103  
Hull Avenue, Des Moines, Iowa  
M. A. Bailey  
Lester A. Gerlach, D.D.S.  
N. F. Gerrie, D.D.S.  
Muriel K. G. Robinson, D.D.S.

**Nominating Committee**

F. C. Cady, D.D.S., *Chairman*, U. S. Public  
Health Service, New York, N. Y.  
K. A. Easlick, D.D.S.  
J. M. Wisan, D.D.S.

**Publications Committee**

George A. Nevitt, D.D.S., *Chairman*, U. S.  
Public Health Service, Washington, D. C.  
Thomas W. Clune, D.M.D.  
K. A. Easlick, D.D.S.

**Resolutions Committee**

R. C. Leonard, D.D.S., *Chairman*, State  
Department of Health, Baltimore, Md.  
W. H. Rumbel, D.D.S.  
C. R. Taylor, D.D.S.

### Engineering Section

**Advisory Policy Committee to the Section  
Council**

(Chairman and personnel to be appointed)

**Committee on Air Pollution**

H. A. Whittaker, *Chairman*, University of  
Minnesota School of Public Health,  
Minneapolis, Minn.  
John Buxell  
Gordon M. Fair  
Burgess H. Jennings  
Sol Pincus, C.E.

**Advisers:****Epidemiology Section**

Alexander D. Langmuir, M.D.

**Industrial Hygiene Section**

C. P. Yaglou

**Laboratory Section**

Stuart Mudd, M.D.

**Committee on Bathing Places** (Joint with  
the Conference of State Sanitary En-  
gineers)

Warren J. Scott, *Chairman*, State Department of Health, Hartford, Conn.  
Thomas M. Riddick

(Two additional appointments to be made)

*Advisers:*

*Epidemiology Section*

Ralph E. Wheeler, M.D.

*Laboratory Section*

Walter L. Mallmann, Ph.D.

**Committee on Coördination of Public Health Engineering Activities**

Roy J. Morton, *Chairman*, Vanderbilt University, Nashville, Tenn.

Gordon M. Fair

Alfred H. Fletcher

H. A. Kroeze

W. H. Larkin, C.E.

Charles L. Senn

Ellis S. Tisdale

**Committee on Exploration of Research Needs**

Blucher A. Poole, *Chairman*, 2715 Ryan Drive, Indianapolis, Ind.

V. M. Ehlers

Francis B. Elder

Harold B. Gotaas

Sol Pincus, C.E.

**Committee on Industrial Sanitation**

Herbert M. Bosch, *Chairman*, State Department of Health, Minneapolis, Minn.

Paul Houser

Blucher A. Poole

*Adviser:*

*Industrial Hygiene Section*

(To be appointed)

**Committee on Municipal Public Health Engineering**

J. Lloyd Barron, C.E., *Chairman*, National Biscuit Company, New York, N. Y.

Leonard M. Board

William J. Dixon

Morton S. Hilbert

Henry D. Peters

Charles L. Senn

Wilmer H. Schulze

J. A. Willman

**Committee on Rural Sewage Disposal**

William T. Ingram, *Chairman*, 1790 Broadway, New York, N. Y.

Paul D. Haney

Albert I. Howd

H. A. Kroeze

David B. Lee

Kenneth H. Spies

Samuel R. Weibel

**Committee on School Sanitation**

Herbert J. Dunsmore, *Chairman*, Calhoun County Health Department, Battle Creek, Mich.

Richard G. Bond

L. M. Clarkson

Albert W. Happy, Jr.

Samuel P. Kingston

Edwin L. Ruppert

*Advisers:*

*School Health Section*

Warren H. Southworth, Dr.P.H.

*Public Health Education Section*

(To be appointed)

**Committee on Sewage Disposal**

Langdon Pearce, *Chairman*, 910 South Michigan Avenue, Chicago, Ill.

Don E. Bloodgood, C.E.

Almon L. Fales

C. G. Gillespie

Clarence E. Keefer

Theodore J. Lafreniere

Maurice LeBosquet, Jr.

Floyd W. Mohlman, Ph.D.

Willem Rudolfs, Ph.D.

Francis M. Veatch

P. J. Alwin Zeller

**Committee on Shellfish**

Milton H. Bidwell, *Chairman*, State Conservation Department, Freeport, N. Y.

L. N. Clarkson

L. M. Fisher

Joseph B. Glancy

Richard Messer

John H. O'Neill

Sol Pincus, C.E.

Kenneth H. Spies

Edward Wright

*Adviser:*

*Laboratory Section*

Chester T. Butterfield

**Committee on Water Supply**

Charles R. Cox, *Chairman*, State Department of Health, Albany, N. Y.  
James Bernard Baty, Major, U. S. Army  
H. J. Darcey

Raymond J. Faust  
Arthur E. Gorman  
Raymond F. Goudey  
Harold Stephens Hutton  
Arthur D. Weston

**Epidemiology Section****Committee on Bathing Places (to cooperate with the Committee on Bathing Places of the Engineering Section)**

Ralph E. Wheeler, M.D., *Adviser*

**Committee on Air Pollution (to cooperate with the Committee on Air Pollution of the Engineering Section)**

Alexander Langmuir, M.D., *Adviser*

**Food and Nutrition Section****Joint Committee on Analyzing Frozen Desserts**

Frederick W. Fabian, Ph.D., *Chairman*, Michigan State College, East Lansing, Mich.  
J. H. Shrader, Ph.D.  
K. G. Weckel, Ph.D.

Oscar Boisvert  
J. O. Clarke  
Marietta Eichelberger, Ph.D.  
Earl A. Louder, Ph.D.  
Ethel A. Martin  
William B. Palmer  
Lloyd K. Riggs, Ph.D.  
Paul F. Sharp, Ph.D.  
Paul H. Tracy, Ph.D.

**Committee on Assay of Foods**

Henry T. Scott, Ph.D., *Chairman*, Wisconsin Alumni Research Foundation, Madison, Wis.  
Fuller D. Baird  
Esther L. Batchelder, Ph.D.  
Ernestine Becker  
Paul L. Day, Ph.D.  
Conrad Elvehjem, Ph.D.  
Herbert E. Longenecker, Ph.D.  
Elmer M. Nelson, Ph.D.

**Committee on Nutritional Problems**

Helen S. Mitchell, Ph.D., *Chairman*, 699 Forest Road, New Haven, Conn.  
Ruth C. Clouse, Ph.D.  
Robert S. Harris, Ph.D.  
Helen A. Hunscher, Ph.D.  
Norman Jolliffe, M.D.  
Charles G. King, Ph.D.  
Frederic W. Nordsiek  
William H. Sebrell, Jr., M.D.

**Committee on Foods (Except Milk)**

Harry W. von Loesecke, *Chairman*, U. S. Department of Agriculture, Washington, D. C.  
Frank L. Gunderson, Ph.D.  
George J. Hucker, Ph.D.  
D. Breese Jones, Ph.D.  
Harry D. Kruse, M.D.  
Reginald C. Sherwood, Ph.D.  
Roe E. Remington, Ph.D.

**Committee on Remuneration**

Margaret C. Moore, *Chairman*, State Board of Health, New Orleans, La.  
Martha Koehne, Ph.D.  
Ferdinand A. Korff  
Ira A. Manville, M.D.  
William A. Queen  
Fred W. Tanner, Ph.D.

**Committee on Membership and Fellowship**

Alice H. Smith, *Chairman*, State Department of Health, Lansing, Mich.  
J. Russell Esty, Ph.D.  
Bernice Hopper  
Ruth M. Kahn  
Dan Mahoney  
Donald K. Tressler, Ph.D.

**Committee on Standard Methods for the Microbiological Examination of Foods**

Harry E. Goresline, Ph.D., *Chairman*, U. S. Department of Agriculture, Washington, D. C.  
M. Thomas Bartram, Ph.D.  
James A. Berry  
Edwin J. Cameron, Ph.D.  
John L. Etchells, Ph.D.  
Frederick W. Fabian, Ph.D., *Consultant*  
Matthew E. Highlands

**Committee on Milk and Dairy Products**

Ethel A. Martin, *Chairman*, 111 N. Canal Street, Chicago, Ill.

Albert C. Hunter, Ph.D.  
Lloyd B. Jensen, Ph.D.  
Carl S. Pederson, Ph.D.

Paul S. Prickett, Ph.D.  
John M. Sharf, Ph.D.  
Oscar B. Williams, Ph.D.

## Health Officers Section

### Committee on Health Officers' Salaries

Edward G. McGavran, M.D., *Chairman*,  
University of Kansas, Kansas City, Kans.  
Dwight M. Bissell, M.D.  
Malcolm R. Bow, M.D.

Andrew J. Krog  
George C. Ruhland, M.D.  
Huntington Williams, M.D.

### Committee on Housing

E. R. Krumbiegel, M.D., *Chairman*, Depart-  
ment of Health, Milwaukee, Wisc.  
Lloyd M. Graves, M.D.

### Committee on Professional Education

V. A. Van Volkenburgh, M.D., *Chairman*,  
State Department of Health, Albany,  
N. Y.  
C. F. Blankenship, M.D.  
John Hackler, M.D.  
E. A. Piszczek, M.D.

## Industrial Hygiene Section

All standing committees were discontinued in 1947 and new committees are now being formed through vote of Section members.

## Laboratory Section

### Coördinating Committee on Standard Methods

Friend Lee Mickle, Sc.D., *Chairman*, State  
Health Department, Hartford, Conn.  
Thomas Francis, Jr., M.D.  
James Gibbard  
A. P. Hitchens, M.D.  
R. A. Kelser, D.V.M.  
Walter L. Mallmann, Ph.D.  
Ralph S. Muckenfuss, M.D.  
Stuart Mudd, M.D.  
A. H. Robertson, Ph.D.  
E. S. Robinson, M.D.  
Geoffrey Edsall, M.D., (*ex officio*), *Secre-*  
*tary*, Division of Biologic Laboratories,  
Boston, Mass.

### Referee<sup>1</sup> for:

Chemical Antiseptics — Henry Welch,  
Ph.D.  
Chemical Disinfectants — Charles M.  
Brewer  
Detergents—Walter L. Mallmann, Ph.D.

### Associate Referee<sup>2</sup> for:

Antibiotic Agents—Selman A. Waksman,  
Ph.D.  
Disinfection of Air by Germicidal Vapors  
and Mists—O. H. Robertson, M.D.  
Disinfection of Air by Ultra-violet Irradia-  
tion—Alexander Hollaender, Ph.D.  
Fungicidal and Fungistatic Agents—C. W.  
Emmons, Ph.D.  
Suppressive Measures for the Control of  
Dust—Clayton G. Loosli, M.D.

### Committee on Salaries

Thomas F. Sellers, M.D., *Chairman*, State  
Board of Health, Atlanta, Ga.  
George M. Cameron, Ph.D.  
George D. Cummings, M.D.  
Charles A. Hunter, Ph.D.  
Edmund K. Kline, Dr.P.H.  
Malcolm H. Merrill, M.D.

### Laboratory Section Archivist

Anna M. Sexton, State Department of  
Health, Albany, N. Y.

### Laboratory Section Representative on the Commisson for the Study of Bio- logical Stains

Edmund K. Kline, Ph.D., Cattaraugus  
County Department of Health, Olean,  
N. Y.

### Committee for the Examination of Germi- cides and Antibacterial Agents

Stuart Mudd, M.D., *Chairman*, University  
of Pennsylvania, Philadelphia, Pa.

<sup>1</sup> Referees are members of the Standard Methods Committee upon which they serve.

<sup>2</sup> Associate Referees are not members of the Stand-  
ard Methods Committee upon which they serve.

# Standard Methods Committee on Biology of the Laboratory Animal

Paul A. Moody, Ph.D., *Acting Chairman*,  
University of Vermont, Burlington, Vt.

## Associate Referees<sup>2</sup>

Arthur M. Cloudman, Ph.D.  
R. G. Daggs, Ph.D.  
Ralph W. Mohri, D.V.M.  
Gregory Pincus, D.Sc.  
Norman J. Pyle, V.M.D.  
Paul B. Swain, Sc.D.  
George B. Wislocki, M.D.

# Standard Methods Committee on Biological Products

Elliott S. Robinson, M.D., *Chairman*,  
R.F.D. No. 4, Laconia, N. H.  
Donald T. Fraser, M.B., D.P.H.  
R. J. Gibbons, M.D.  
Harold W. Lyall, Ph.D.  
John T. Tripp, Ph.D.  
Milton V. Veldee, M.D.

# Standard Methods Committee on Diagnostic Procedures and Reagents

Ralph S. Muckenfuss, M.D., *Chairman*,  
City Health Department, New York,  
N. Y.

(All referees and associate referees to be appointed)

# Standard Methods Committee on Diagnostic Procedures in Virus and Rickettsial Diseases

Thomas Francis, Jr., M.D., *Chairman*, University of Michigan, Ann Arbor, Mich.

## Referee<sup>1</sup> for:

Atypical Pneumonia—Alto E. Feller, M.D.  
Dengue and Sandfly Fever—Albert E. Sabin, M.D.  
Encephalitis—William McD. Hammon, M.D.  
Inclusion Blennorrhoea—Phillip Thygeson, M.D.  
Influenza—George K. Hirst, M.D.  
Lymphogranuloma Venereum—Geoffrey W. Rake, M.B.  
Mumps—John F. Enders, Ph.D.  
Poliomyelitis—John R. Paul, M.D.  
Psittacosis and Ornithosis—Karl F. Meyer, M.D.  
Rabies—Harald N. Johnson, M.D.  
Rickettsial Diseases—Joseph E. Smadel, M.D., and Norman H. Topping, M.D.  
Yellow Fever—Richard M. Taylor, M.D., and John Bugher, M.D.

# Standard Methods Committee on Frozen Desserts and Ingredients (Joint with the Committee of Food and Nutrition Section)

A. H. Robertson, Ph.D., *Chairman*, State Department of Agriculture and Markets, Albany, N. Y.  
James Gibbard  
Leon Buchbinder, Ph.D.

## Referee<sup>1</sup> for:

Chemical Analysis of Frozen Desserts and Ingredients—J. H. Shrader, Ph.D.  
Microbiological Examination of Frozen Desserts—A. H. Robertson, Ph.D.  
Microbiological Examination of Ingredients—F. W. Fabian, Ph.D.  
Sediment Testing of Frozen Desserts and Ingredients—K. G. Weckel, Ph.D.

## Associate Referee<sup>2</sup> for:

Chemical Determinations of Modified Babcock Methods for Frozen Desserts—W. H. Martin  
Chemical Determinations of Stabilizers in Frozen Desserts—F. Leslie Hart  
Determination of Overrun in Ice Cream—P. S. Lucas  
Microbiological Examination of Condensed and Evaporated Milk—Paul A. Downs, Ph.D.  
Microbiological Examination of Dry Milk—Paul S. Prickett, Ph.D.  
Microbiological Examination of Eggs—M. Thomas Bartram, Ph.D.  
Microbiological Examination of Flavors, Colors, Fruits, and Nuts—M. J. Prucha, Ph.D.  
Microbiological Examination of Sugar—H. H. Hall  
Sampling for Chemical Determinations—P. H. Tracy, Ph.D.

# Standard Methods Committee on Examination of Milk and Milk Products

A. H. Robertson, Ph.D., *Chairman*, State Department of Agriculture and Markets, Albany, N. Y.  
Luther A. Black, Ph.D.  
Robert S. Breed, Ph.D.  
Angel de la Garza Brito, M.D.  
Raoul F. Cowley

<sup>1</sup> Referees are members of the Standard Methods Committee upon which they serve.

<sup>2</sup> Associate Referees are not members of the Standard Methods Committee upon which they serve.

*Referee*<sup>1</sup> *for:*

Chemical Methods for Examining Dairy Products—William A. Queen

Comparative Tests of Agar Media for Standard Milk Work—S. R. Damon, Ph.D.

Coördination of Milk Ordinance and Laboratory Work—A. W. Fuchs, C.E.

Laboratory Equipment — Raymond V. Stone, D.V.M.

Methods of Counting Bacteria in Dairy Products—A. H. Robertson, Ph.D.

Methods for Detecting Organisms of the Coliform Group—Albert J. Slack, M.D.

Methods of Isolating Specific Types of Bacteria in Dairy Products—Mac H. McCrady

Methylene Blue Reduction Test — C. A. Abele, Ch.E.

Microbiological Methods for Examining Butter—Ralph V. Hussong, Ph.D.

Sediment Test—E. H. Parfitt, Ph.D.

Tests for the Sterility of Dairy Utensils—Walter D. Tiedeman, M.C.E.

*Associate Referee*<sup>2</sup> *for:*

Methods for the Examination of Cheese—M. W. Yale, Ph.D.

Methods for Examining Milk for Evidences of Brucella Infection—I. F. Huddleson, Ph.D.

Methods of Examining Milk for Tubercle Bacilli—William A. Hagan, D.V.M.

Methods of Identifying Streptococci in Dairy Products—George J. Hucker, Ph.D.

Phosphatase Test—Professor L. H. Burgwald

Resazurin Test—C. K. Johns, Ph.D.

*Subcommittee on Methylene Blue Reduction and Resazurin Tests:*

C. A. Abele, Ch.E., *Chairman*, Board of Health, Chicago, Ill.

C. K. Johns, Ph.D.

E. H. Parfitt, Ph.D.

A. H. Robertson, Ph.D.

H. R. Thornton, Ph.D.

*Subcommittee on Sediment Testing:*

E. H. Parfitt, Ph.D., *Chairman*, 307 North Michigan Avenue, Chicago, Ill.

J. O. Clarke

K. G. Weckel, Ph.D.

*Joint Editorial Committee for Standard Methods for the Examination of Dairy Products:*

Robert S. Breed, Ph.D., *Chairman*, New York State Agricultural Experiment Station, Geneva, N. Y.

A. Parker Hitchens, M.D.

Albert C. Hunter, Ph.D.

Friend Lee Mickel, Sc.D.

Henry T. Scott, Ph.D.

*Standard Methods Committee on Examination of Water and Sewage*

Walter L. Mallmann, Ph.D., *Chairman*, Michigan State College, East Lansing, Mich.

*Referee*<sup>1</sup> *for:*

Bacteriological Methods for Water—Mac H. McCrady

Coliform Group Variants—Charles A. Stuart, Ph.D.

Microscopic Methods of Water—Theodore A. Olson

Swimming Pool and Bathing Place Waters—Walter L. Mallmann, Ph.D.

*Standard Methods Committee on Examination of Shellfish*

James Gibbard, *Chairman*, Department of Pensions and National Health, Ottawa, Ont.

Paul Arnehausen

Victor H. Bertullo, D.V.M.

Leon Buchbinder, Ph.D.

Chester T. Butterfield

Clifford Byrd

Eduardo Joubanc

C. B. Kelly, Jr.

Dorothy Phelps

Charles E. Renn

Leslie A. Sandholzer, Ph.D.

Glenn G. Slocum

<sup>1</sup> Referees are members of the Standard Methods Committee upon which they serve.

<sup>2</sup> Associate Referees are not members of the Standard Methods Committee upon which they serve.



## Maternal and Child Health Section

### Committee on Health Standards for Children's Camps

Milton I. Levine, M.D., *Chairman*, 302 West 12th Street, New York, N. Y.  
Helen F. Leighty  
L. B. Sharp, Ph.D.

### Committee on Membership and Fellowship

Paul R. Ensign, M.D., *Chairman*, State Board of Health, Topeka, Kan.  
Hester B. Curtis, M.D.  
Marcia Hays, M.D.  
Edythe P. Hershey, M.D.

Herbert R. Kobes, M.D.  
Kenneth S. Landauer, M.D.

### Program Committee

Myron E. Wegman, M.D., *Chairman*, Louisiana State University, New Orleans, La.  
Katherine Bain, M.D.  
Samuel R. Berenberg, M.D.  
Amos Christie, M.D.  
Edward Davens, M.D.  
Samuel B. Kirkwood, M.D.  
Marie-Louise Pareti, M.D.  
Leon Sternfeld, M.D.

## Public Health Education Section

### Regional Committees

#### Committee on Public Health Education Problems in the Far West Region

Howard W. Lundy, Dr.P.H., *Chairman*, State Department of Health, Seattle, Wash.  
Ann W. Haynes, Section Council Sponsor, State Department of Health, San Francisco, Calif.

#### *Membership:*

All Section Fellows and members in the States of the Far West Region—Washington, Oregon, Nevada, California.

(Fellows and members of Alaska, the Territory of Hawaii, and the Philippine Islands may work with this group although essentially not a part of the Far West Region plan.)

#### Committee on Public Health Education Problems in Latin America

Philip L. Riley, *Chairman*, C.I.A.A., 6616 Commerce Dept. Bldg., Washington, D. C.  
Alice M. Johnson, Section Council Sponsor, U. S. Public Health Service, Washington, D. C.

#### *Membership:*

All Section Fellows and members in Puerto Rico, Mexico, and South American countries.

#### Committee on Public Health Education Problems in the Middle States Region

Hugh Masters, *Chairman*, Kellogg Foundation, Battle Creek, Mich.  
Lewis C. Robbins, M.D., Section Council Sponsor, U. S. Public Health Service, Chicago, Ill.

#### *Membership:*

All Section Fellows and Members in the States of the Middle States Region—Minnesota, Wisconsin, Iowa, Missouri, Illinois, Indiana, Ohio, Michigan.

#### Committee on Public Health Education Problems in the Northeastern Region

Homer N. Calver, *Chairman*, 1790 Broadway, New York, N. Y.  
Bess Exton, Section Council Sponsor, National Education Association, Washington, D. C.

#### *Membership:*

All Section Fellows and members in the States of the Northeast Region—Maine, Vermont, New Hampshire, Massachusetts, New Jersey, Rhode Island, West Virginia, Maryland, Pennsylvania, New York, Washington, D. C., Connecticut.

**Committee on Public Health Education  
Problems in the Northwestern Region**

Edna Gerken, Chairman, U. S. Office of the Interior, Chicago, Illinois.

Mabel Rugen, Ph.D., Section Council Sponsor, University of Michigan, Ann Arbor, Mich.

*Membership:*

All Section Fellows and members in the States of the Northwest Region—Montana, Idaho, Utah, Wyoming, Colorado, Nebraska, North Dakota, Kansas, South Dakota.

**Committee on Public Health Education  
Problems in the Southeastern Region**

Helen A. Martikainen, *Chairman*, U. S. Public Health Service, Richmond, Va.

Eunice Tyler, Ph.D., Section Council Sponsor, University of North Carolina, Chapel Hill, N. C.

*Membership:*

All Section Fellows and members in the States of the Southeast Region—Kentucky, Virginia, North Carolina, Tennessee, South Carolina, Arkansas, Florida, Mississippi, Alabama, Georgia, Louisiana.

**Committee on Public Health Education  
Problems in the Southwestern Region**

Opal Hartline, Ph.D., *Chairman, Pro Tem*, City-County Health Unit, El Paso, Tex.

J. Louis Neff, Section Council Sponsor, American Cancer Society, Houston, Tex.

*Membership:*

All Section Fellows and members in the States of the Southwest Region—Arizona, New Mexico, Texas, Oklahoma.

**Cross Section Committees**

**Committee on Community Organization  
for Health Education**

Clair E. Turner, Dr.P.H., *Chairman*, National Foundation for Infantile Paralysis, New York, N. Y.

(Personnel to be appointed)

**Committee on Coördination of Public  
Health Education Section with all  
Other Sections of the A.P.H.A.**

Muriel F. Bliss, Ph.D., *Chairman*, Hartford Tuberculosis and Public Health Society, Hartford, Conn.

(Personnel to be appointed)

**Committee on Convention Public Health  
Education Practices**

**Materials and Publicity**

Rae K. Shoemaker, *Chairman*, National Foundation for Infantile Paralysis, New York, N. Y.

Sallie Bright, *Co-chairman*, National Publicity Council for Health and Welfare Services, New York, N. Y.

**Committee on Post-war Planning in  
Public Health Education**

Mayhew Derryberry, Ph.D., *Chairman*, U. S. Public Health Service, Washington, D. C.

(Personnel to be appointed)

**Motion Picture Theatre**

Thomas C. Stowell, *Chairman*, State Department of Health, Albany, N. Y.

Kenneth Widdemer, *Co-chairman*, 137 Centre St., New York, N. Y.

**Committee on Public Health Films**

Kenneth D. Widdemer, *Chairman*, New York Health Council, New York, N. Y.

(Personnel to be appointed)

**Press Relations**

Anna B. Towse, *Chairman*, Onondaga Health Association, Syracuse, N. Y.

**Committee on Regionalism—Liaison with  
Social Science**

Lucy S. Morgan, Ph.D., *Chairman*, University of North Carolina, Chapel Hill, N. C.

(Personnel to be appointed)

**Scientific Exhibits**

Marie Harrington, *Chairman*, 4030 Chouteau Avenue, St. Louis, Mo.

**Committee on Utilization of Commercial  
Advertising for Health Education**

Edna M. Kech, *Chairman*, State Department of Health, Harrisburg, Pa.

(Personnel to be appointed)

## School Health Section

### Committee on Evaluation of School Health Programs

David A. Van der Slice, M.D., *Chairman*,  
215 Welch Boulevard, Flint, Mich.  
Isaac P. Barrett, M.D.  
Vaughn S. Blanchard  
Rose C. Boyer, M.D.  
Bertha Ashby Hess  
Hortense Hilbert, R.N.  
Lon W. Morrey, D.D.S.  
Delbert Oberteuffer, Ph.D.  
George T. Palmer, Dr.P.H.  
Charles J. Prohaska, M.D.  
W. Carson Ryan, Ph.D.  
C. Morley Sellery, M.D.  
M. Louise Strachan  
Charles C. Wilson, M.D.

### Committee on Pre-service and In-service Training of School Personnel

Ruth E. Grout, Ph.D., *Chairman*, University  
of Minnesota, Minneapolis, Minn.

Ruth E. Boynton, M.D.  
Maud A. Brown  
Clarence W. Davis  
H. F. Kilander, Ph.D.  
Nina B. Lamkin  
Elizabeth McGuire  
Fredrika Moore, M.D.  
Charles J. Prohaska, M.D.  
Robert M. Robbins, M.D.  
Genevieve R. Soller, R.N.  
Harry Strusser, D.D.S.  
Anne L. Whitney  
Mary M. Wyman

### Committee to Study School Health Legislation

George T. Palmer, Dr.P.H., *Chairman*, State  
Department of Public Health, San Fran-  
cisco, Calif.  
(Personnel to be appointed)

## Vital Statistics Section

### Committee on Membership and Directory

Iwao M. Moriyama, Ph.D., *Chairman*,  
U. S. Bureau of the Census, Washington,  
D. C.  
Marjorie T. Bellows  
Clara E. Councell  
Marguerite F. Hall, Ph.D.  
A. W. Hedrich, D.Sc.

### Committee on Opportunities in Statistical Work

Ellen B. Whiteman, *Chairman*, Common-  
wealth Fund, New York, N. Y.

Paul M. Densen, D.Sc.  
Margaret Martin

### Committee on Professional Standards and Remuneration

Paul M. Densen, D.Sc., *Chairman*, Veterans  
Administration, Washington, D. C.  
Halbert L. Dunn, M.D.  
Elliott H. Pennell  
Mary A. Ross, Ph.D.  
Oswald K. Sagen, Ph.D.

## Representatives of the American Public Health Association to Other Organizations and Committees for 1947

### Advisory Council on Medical Education

William P. Shepard, M.D.  
James A. Doull, M.D., alternate

### American Association for the Advancement of Science

Reginald M. Atwater, M.D.  
Abel Wolman, Dr.Eng.

### American Association of Teachers Colleges

Committee on Standards and Survey  
Jessie Bierman, M.D.,  
Representing the School Health Section

### American Association for Health, Physical Education, and Recreation

Preparation of Platform for Health  
Education

Eunice Tyler, Ph.D.  
Representing the Public Health Edu-  
cation Section  
Charles L. Williams, Jr., M.D.,  
Representing the School Health Section

### Relationships with Voluntary Agencies

Elizabeth M. Semenov,  
Representing the School Health Section

## American Camping Association

Francis B. Elder

## American Committee on Maternal Welfare

Thomas Parran, M.D.

## American Documentation Institute (1946-1950)

Halbert L. Dunn, M.D.

## American Hospital Association (liaison representative)

Charles F. Wilinsky, M.D.

## American Society for Testing Materials—Committee on Soap

Carl R. Fellers, Ph.D.

## American Standards Association

## Building Code Correlating Committee (1945-1947)

J. Lloyd Barron, C.E.

W. Scott Johnson, alternate

## Letter Symbols and Abbreviations for Science and Engineering

Earle B. Phelps

## Safety Code for Dry Cleaning Establishments

H. H. Schrenk, Ph.D.

H. G. Dyktor, alternate

## Sectional Committee on Allowable Concentrations of Toxic Dusts and Gases

J. J. Bloomfield

## Sectional Committee on Bedding and Upholstery—Subcommittee on Sterilization

F. J. Maier

## Sectional Committee on Building Code Requirements for Light and Ventilation

Rollo H. Britten

C.-E. A. Winslow, Dr.P.H.

## Sectional Committee on Minimum Requirements for Plumbing and Standardization of Plumbing Equipment, A-40 and Subcommittee No. 1

M. Warren Cowles

Sol Pincus, C.E.

## Sectional Committee on Places of Outdoor Assembly

J. Lloyd Barron, C.E.

## Sectional Committee on School Lighting

Leonard Greenburg, M.D.

Joel I. Connolly, alternate

## American Standards Association (Cont.)

## Sectional Committee on the Safety Code for Exhaust Systems Z9

Allen D. Brandt, Sc.D.

## Sectional Committee on the Safety Code for Industrial Sanitation in Manufacturing Establishments

Leonard Greenburg, M.D.

Kenneth E. Markuson, M.D., alternate

## Ventilation Code

Earle B. Phelps

## American Trudeau Society, National Tuberculosis Association, and the American Hospital Association, joint with the A.P.H.A.

Joseph G. Molner, M.D.

## Board to Certify Non-Medical Experts in Human Nutrition

Charles G. King, Ph.D.

## Commission for the Study of Biological Stains

William D. Stovall, M.D.

## Council on Rheumatic Fever

David Rutstein, M.D.

George M. Wheatley, M.D.

## International Congress on Tropical Medicine and Malaria (Organization Committee)

Henry E. Meleney, M.D.

## Joint Committee on Community Nursing Service of the National Organization for Public Health Nursing

Alfred L. Burgdorf, M.D.

## Joint Committee of the Illuminating Engineering Society and the A.P.H.A.

Leonard Greenburg, M.D.

M. Allen Pond

Donald Y. Solandt, M.D.

## Joint Committee on Water and Sewage Works Terms (Joint with the American Society of Civil Engineers, the American Water Works Association and Federation of Sewage Works Associations)

Sol Pincus, C.E.

## National Bureau of Standards—Standing Committee on Insect Wire Screening TS-3977

C. C. Kiker

## National Conference for Cooperation in School Health Education

C. C. Wilson, M.D.

## National Conference on Home Safety

Reginald M. Atwater, M.D.

## Committee on Education and Public Information

Dorothy B. Nyswander, Ph.D.

## Committee on Home Accident Statistics

Iwao M. Moriyama, Ph.D.

## National Conference on Uniform Traffic Accident Statistics

Robert J. Vane

## National Council on Rehabilitation

Hart E. Van Riper, M.D.

## National Health Council

Reginald M. Atwater, M.D.

Louis I. Dublin, Ph.D.

Ernest L. Stebbins, M.D.

## National Nutrition Advisory Committee

Robert H. Riley, M.D.

## National Organization for Public Health Nursing—

## School Health Committee

Ruth Evans

Mildred Lant

Representing the School Health Section

Committee on Study of Costs in Public Health Nursing  
Abel Wolman, Dr.Eng.

## National Safety Council

## Home Safety Advisory Committee

Edward S. Rogers, M.D.

## National Committee on Films for Safety

Harry E. Kleinschmidt, M.D.

## National Technological Civil Protection Committee

Abel Wolman, Dr.Eng.

Arthur E. Gorman, alternate

## Third American Congress on Obstetrics and Gynecology

Thomas Parran, M.D.

## Third National Conference on Health in Colleges

Francis B. Elder

## United Nations Educational, Social, and Cultural Organization

Reginald M. Atwater, M.D.

Francis B. Elder

## Credit Lines

### MARCH RECORD FOR NEW MEMBERS

The membership department of the Association has been boasting ever since the mail was distributed on March 24. On that day the 237th application of the month for membership in the Association was received. Another record was broken. By the end of March 299 applications had come in, a record never before equalled. Between January 1 and March 31, 610 persons applied for membership. This is more than the total number of new members during any of the years, 1929, 1931, 1932, and 1933.

And who gets the credit for this new record? The members of the Association themselves. Half of these new applications came on formal nomination of members, nearly 50 used the *Journal* application blanks and must also have been inspired by members. Ten per cent came in through affiliated societies.

A few more statistics! Nearly one-fifth of the new members applied for admission to the Public Health Nursing Section, more than 30 each to the Laboratory, Health Officers, and Engineering Sections, 29 to Public Health Education, and the remaining 113 were divided among the 7 other sections and unaffiliated.

Geographically all but 12 states are represented by March's 299 members. In addition, Alaska, Hawaii, and Puerto Rico are represented, as well as Brazil, Canada, China, Ecuador, Mexico, and the Philippines.

The ages of the applicants range from 21 to 75 and, by way of illustrating the public health worker's detachment from the more mundane affairs, one applicant was reported born in February, 1947, and one in August, 1947.

The total membership of the Association at the end of March was 10,830. The goal is 12,000 by the time of the annual meeting in October. For the list of the 299 March newcomers see p. 617.

### CLEANLINESS EDUCATION

*Cleanliness Training and Health Education*, the monthly double page leaflet of the Cleanliness Bureau of the American Association of Soap and Glycerine Producers (11 West 42nd St., New York 18) has a lot of fertile ideas for the health educator. The February issue for example, tells the story of "The Search for Health," a health project developed from the fifth grade of a school in Escanaba, Mich. The interest of the children was aroused through ancient history—the witch doctor, the medicine man, the Roman baths, the Black Death of the Middle Ages. At the end of the project they had not only widened horizons but a broad background of health knowledge.

Among other items in the February issue are "Schenectady's Exhibit 'A' in Public Building Cleanliness" and "Cincinnati Schools Teach the Reason for Cleanliness."

### FOOD SOUTH OF THE EQUATOR

Those whose interest in food and nutrition problems goes beyond their own doorsteps will find *Paraguayan Rural Life: Survey of Food Problems* rewarding. A special report of the Food Supply Division of the Institute of Inter-American Affairs (Washington, D. C.), it is a good, brief sociological picture of Paraguay, illustrated with many photographs. Among other uses this would be excellent laboratory material for high school nutrition, geogra-

phy, or social science classes. Other special reports of the Division are available, discussing food and agricultural conditions in Brazil, Haiti, Honduras, Panama, and Venezuela.

#### CONNECTICUT CANCER SOCIETY

##### HANDBOOK

The Connecticut Cancer Society has published a loose leaf reference manual for its officers and workers. Here is excellent background material to orient workers in the history of their organization and the place it fills in cancer education. The outstanding dates of both the National and Connecticut Cancer Societies are mentioned, the organization of the State Society and the work of the State Health Department's Cancer Division. There are instructions for organizing a district, for carrying on an education program, for developing publicity. The printing, paper, typography and layout are all good. Not the least of its virtues is that it is loose leaf, for ease in being kept up to date. The impressive looking map with which it starts puzzles us. It needs more extensive legends to be fully understandable.

The offices of the Connecticut Cancer Society are at 95 North Main Street, Waterbury 14.

#### MILESTONES IN TUBERCULOSIS CONTROL

*The Long Adventure*, in its 31 pages, makes poetry in prose of the daring and stirring adventure of penetrating the mystery of tuberculosis. Beginning with Hippocrates and his first detailed descriptions of the disease, there are short but meaty chapters on Laënnec, Villemin, Pasteur, Koch, Roentgen, Theobald Smith, Trudeau, Forlanini, Murphy, and Philip, in addition to recent moderns such as Welch, Biggs, Osler, and Flick. Gaily illustrated in a bright yellow cover, this is an inspired piece of historical writing in the

service of present-day understanding and support of tuberculosis control measures. The author is Marie McCall; the publisher, the National Tuberculosis Association, 1790 Broadway, New York 19.

#### THE OTA TEST AND FREE RESIDUAL CHLORINATION

The following is of interest to all public health workers concerned with water treatment and supplies and is taken from *Health News*, Vol. 24, No. 8 (Feb. 24), 1947, of the New York State Department of Health:

Water supply officials, generally speaking, have not adopted either the orthotolidine arsenite (OTA) test or the practice of superchlorination to the extent which seems justified, according to a review of current chlorination practice in New York State. Wider application of these modern procedures is warranted by the numerous advantages they offer.

##### ADVANTAGES OF THE OTA TEST

The conventional orthotolidine (OT) test has been of great value in the control of the chlorination of water. It gives erroneous results, however, when manganese or nitrites are present in the water being tested. Furthermore, the results when correct represent the total concentration of residual chlorine and not the proportion of free residual chlorine of high disinfecting power or the proportion of residual combined chlorine.

The new test (OTA) gives accurate results in the presence of interfering substances in the water and, of greater importance, provides the means of controlling the chlorination of water so as to produce free residual chlorine. It affords, therefore, a means of determining when superchlorination or free residual chlorination reactions occur; that is, when the deleterious influence of organic matter, high pH and low temperature of the water have been nullified and conditions which will insure rapid disinfection have been created.

There are a large number of water supplies to which ammonia is not added but in which, in the raw state, there is sufficient ammonia, accompanied by organic matter, to result in the formation of chloramines or combined residual chlorine; in such instances, operators have not realized the need of main-

taining higher concentrations of combined residual chlorine because of its lesser disinfecting action. In other instances, it has been found that a minor increase in the dose of chlorine will result in formation of free residual chlorine with the benefits outlined below.

The OTA test, therefore, should be used in connection with the chlorination of all water supplies to disclose basic information. It need be made only a few times a week if the "flash test" is used each day to disclose the approximate concentration of free residual chlorine.

#### SUPERCHLORINATION OR FREE RESIDUAL CHLORINATION

Free residual chlorination has been used primarily at water filtration plants because the detention period in coagulation basins or clear wells has been sufficient for the completion of secondary reactions before the water reached the consumer. On the other hand, the absence of a filtration plant may create conditions which can best be overcome by the use of free residual chlorination. This relatively new treatment procedure should be utilized more generally for the treatment of unfiltered surface supplies, especially when treated water may be stored in a reservoir or basin for two hours or more to permit such secondary actions as the control of algae, bleaching, and the precipitation of iron, manganese, and organic matter coagulated by chlorine.

The significant fact is that free residual chlorination achieves all these benefits together with more effective disinfection, production of stable residual chlorine, and elimination of chlorinous tastes. Formerly, stable chloramines (chlorine-ammonia treatment) were not effective disinfectants; any increase in the concentration of chloramines or combined residual chlorine to secure effective disinfection frequently caused chlorinous tastes.

For these reasons, it is important that water supply officials appraise the supplies under their supervision to determine how best this improved disinfecting process may be used. Higher capacity chlorinators will be needed most likely in many instances to permit the practice of free residual chlorination which offers the following additional advantages: destruction by oxidation of taste- and odor-producing compounds; control of deleterious growths inside water mains; and the prevention of biochemical corrosion through the destruction of organisms associated with the production of organic acids or the reduction of sulphates to sulphides.

#### ANOTHER APPROACH TO INTERGOVERNMENTAL COÖPERATION

In November ("Grass Roots Planning," p. 1327), we suggested that you watch for the report of the Colquitt County (Georgia) Council on Intergovernmental Relations. The third in the series of Spelman Foundation supported inquiries into ways in which local government can be accommodated to the 20th century, this one places main emphasis upon a coördinated agricultural plan.

It also includes, however, an exploratory study in the field of public health. It finds that the experience of a city-county health department has much to contribute to coördination in other areas of public service.

This report of a field laboratory for study and experiment in intergovernmental relations can be secured from Colquitt County Council on Intergovernmental Relations, Moultrie, Ga.

#### REPORT FROM HAWAII

Two reports have come out of Hawaii indicating that its civilian services have gone back to a peacetime basis after the upheavals of Pearl Harbor. The first is the *Annual Report of the Territorial Board of Health* for the year ending June 30, 1946, by its President, C. L. Wilbar, Jr., M.D. Its nearly 150 pages contain a very complete report of the Territory's house-keeping and the special health problems that it faces in the immediate future.

The second is a report on *School Health Programs in the Territory of Hawaii* by its Chamber of Commerce. The Chamber has an active Public Health Committee directed by R. S. Nebelung, Dr.P.H. Its Committee on School Health, with numerous subcommittees, has developed this long-range school health program designed to give the child an opportunity to attain his optimum state of physical fitness.



## ANNUAL REPORTS

Oklahoma Health Department—The cover of the Oklahoma State Department's *Biennial Report* has an attractive photograph of the department's building in Oklahoma City superimposed upon the state map and outlined in a bright, cheery red. Inside the covers the attractive layout continues with photographs and charts telling as much of the story as possible. There is no reason why the citizens of Oklahoma should any longer lack information about their Health Department—what it does and what it needs to carry out its long-range program.

Hartford (Conn.) Health Department—The *Triennial Report* of the Hartford City Health Department comes in an apple green attractive cover, and drawings and a wealth of photographs illustrating the work of the department. It points out that Hartford's public health history goes back to 1784 when the Court of Common Pleas appointed a committee to investigate nuisances. The city's first Board of Health was established in 1885; since that time annual or biennial reports have been continuous.

The citizens of Hartford who read this report should be in no confusion as to the services provided by their Health Department.

## REPORT FROM INDIA

The Secretary of State of the United States sends us, from the Consulate General at Calcutta, India, a *Summary Report of the All-India Institute of Hygiene and Public Health* for the 5 year period 1940 to 1944, together with a prospectus of the courses given at the Institute.

During all this period John B. Grant, M.D., was Director of the Institute, on loan from the Rockefeller Foundation which has also contributed extensively to the support of the Institute during these years.

Even a casual study of the report and prospectus, and particularly of the research projects carried on, reinforces the conviction that this is "one world" in public health as well as in other matters.

The introduction of the report gives a good brief history of public health education and the Institute. Between 1910 and 1922 Calcutta University, although proper facilities for instruction were lacking, maintained an Institute for the Diploma in Public Health. In 1922 the D.P.H. course was transferred to the School of Tropical Medicine. Finally in 1933 the All-India Institute was organized, and in 1939 Dr. Grant became its Director for a period of more than 5 years.

## ULSTER COUNTY (N. Y.) REPORTS

## ITS PROGRESS

The February *Journal* (p. 245) told you of the organization of the Ulster County (N. Y.) Health Department under the 1946 legislation that encourages, with generous state aid, the development of full-time county health departments to replace the numerous uncoordinated part-time town and village departments.

This new county health department apparently intends to document its history fully. Credit Lines has just received its first monthly report for January, 1947. Here is outlined briefly how the department was organized and the staff taken over from the state district office which had previously served the area. A complete list of personnel is shown. Public health nurses actually on the job were in the ratio of one to 6,200 population; the full complement of nurses with all vacancies filled would be one per 5,100 population. Environmental sanitation personnel—engineers, veterinarians, and sanitary inspectors—were in the ratio of approximately one per 15,000 population.

Another interesting note is that the

largest city in the county and two additional towns have already abolished their own separate boards of health, a development that is permissive but not mandatory under the new law.

#### TYPHOID FROM ICE CREAM

The Borough of Aberystwyth, Wales, was the center of an outbreak of typhoid fever during the summer of 1946. The vector was traced to an ice cream supply manufactured and sold by a licensed vendor resident in the Borough. Investigation disclosed the fact that the vendor was a urinary carrier of typhoid—a condition which apparently had persisted since an attack of typhoid in 1938.

During the investigation of the epidemic, water and milk were ruled out quickly and attention was focused on the ice cream supply. The epidemic stopped abruptly upon the barring of further sales of ice cream. Over 200 cases in all were reported. The account of the epidemic in detail is contained in the January 25, 1947, issue of *The Medical Officer*, a British publication.

#### WORTH ACQUIRING

The latest of the National Publicity Councils How-to-Do-It publications is *Radio—How, When and Why to Use It*. By Beatrice K. Tolleris (who will be remembered as the author of *Annual Reports—How to Write Them*), it is a manual on non-commercial broadcasting that analyzes the factors determining when a community agency should take to the air to win understanding and support. Once that has been decided, the techniques for getting sustaining time and the uses of the various programs, such as interview, round table, dramatization, and on-the-spot broadcast are outlined, as well as program promotion. It is written especially for the busy executive. National Publicity Council, 130 East 22nd Street,

New York 10, \$1.00 per copy. Progressively reduced rates for orders of 10 or more copies.

*Food the World Over*—Credit Lines has already mentioned (July, 1946, p. 803) the "Food the World Over" series of the Brooklyn Visiting Nurse Association (138 So. Oxford St., Brooklyn 17, N. Y.). The fourth of the series deals with the food habits of Polish groups and suggests ways of building their customary dietary up to everyday nutrition standards. These booklets are planned specifically for professional workers as an aid in nutrition teaching. The earlier booklets in the series deal with foods used respectively by Puerto Rican, Italian, and Jewish groups; later ones will cover Syrian and sectional American dietaries. 20 cents per copy.

*Facts about Syphilis and Gonorrhea*, *Wedding Plans*, and *Protecting the Unborn Baby from Syphilis* are three leaflets of the Industrial Hygiene Division of the U. S. Public Health Service. Their text is: "VD may not take a man off the production line now—but the eventual loss if he goes untreated will be high." Intended especially for distribution to industrial workers. Sample copies free from U. S. Public Health Service, Washington, D. C. Quantity orders \$1.50 per 100, and \$2.50 per 100 for *Facts about Syphilis and Gonorrhea* from Superintendent of Documents, Govt. Ptg. Office, Washington 25, D. C.

A series of 10 nutrition charts has been prepared by the U. S. Bureau of Human Nutrition and Home Economics as a visual teaching aid for nutrition classes and wall exhibit use. Done in yellow and black on heavy white paper, the charts have photographs of laboratory animals which show the importance of a well balanced diet. The theme is "Food makes a difference." Available in sets only at 75 cents a set, Govt. Ptg. Office, Washington 25, D. C.

## BOOKS AND REPORTS

*All reviews are prepared on invitation. Unsolicited reviews cannot be accepted. All books reviewed in these columns may be purchased through the Book Service.*

The Personality of the Preschool Child. A Child's Search for His Self—By Werner Wolff, Ph.D. Foreword by Mary Fisher Langmuir. New York: Grune & Stratton, 1946. 341 pp. Price, \$5.00.

This record of extensive explorations into the various aspects of a young child's personality may be somewhat overwhelming for the average public health worker who is unfamiliar with the experimental techniques used and who may be skeptical of the conclusions drawn. But its basic point of view is one which all such workers should have: viz., that the child's social behavior, his emotional development, his intellectual activities, all must be understood from the point of view of his own culture, from how *he* "sees," "feels," or "understands" things. The author presents a concept of two worlds, that of child and that of adult, and illustrates the tremendous gap which lies between them. He warns us not to transfer the concepts of adult psychology to child psychology. Emphasis is placed on the need for bridging the gap between the so-called worlds and many valuable hints are given for doing so. Misconceptions of the nature of the young child are freely discussed and the dangers of relying too heavily on the fact that the child's growth follows a definite pattern. The need for understanding the unique pattern of personality in each individual child is also made clear. A concept that "all expressions of personality by the young child seem to be varieties on one theme; the child's search for his self" is also emphasized. It is these general con-

cepts which all readers will find stimulating and provocative.

The book is fairly well documented.  
LEONA BAUMGARTNER

Scheduled Salaries for Social Work Positions in Hospitals in New York City, December, 1946—By Ralph G. Hurlin. New York: Russell Sage Foundation, 1947. 42 pp. Price, \$.40.

This pamphlet is issued in advance of a wider inquiry relating to social work salaries in medical agencies of New York City generally.

Its opening statement says, "The results are being made available in advance of the wider inquiry because it is believed they will be immediately useful to both employing agencies and social workers in evaluating present salaries."

Salary schedules, with related employment conditions, are shown for voluntary hospital social service departments as well as for city, state, and federal hospitals in the city. Generally speaking, salaries are highest in the federal hospitals and lowest in the city hospitals. In the voluntary hospitals, \$2,400 has come to be a standard minimum annual salary for case workers, representing in many instances an increase of one-third within the past year. The minimum for the same position is \$3,397 in veterans' hospitals; \$3,036 in Army and Navy hospitals; \$2,268 in state mental hospitals; and \$2,160 in city hospitals.

Among Mr. Hurlin's conclusions is that low salaries are responsible for unfilled positions in the social work departments of hospitals in New York

City. This is true in spite of the fact that nearly all workers received salary increases during 1946. The hopeful note is a "growing recognition of the inadequacy of social work salaries in relation to the nature of the work and the preparation asked of social workers."

This study and the larger study of which it is a part have much to contribute to those who are studying public health salaries in relation to current living costs, personnel shortages, and qualification standards of public health workers.

MARTHA LUGINBUHL

**Morton's Memoir**—By W. T. G. Morton. New York: Henry Schuman, 1946. 24 pp.

John Fulton of the Historical Library, Yale Library, has given us a first reprint of Morton's charming letter to the Academy of Sciences at Paris. It is published on the occasion of the centennial of ether discovery. In this *Memoir*, Morton presented a simple and direct narrative of his experiments with the use of nitrous ether in order to refute the claims of Wells and Jackson to its discovery. It documents very properly Robinson's history of anesthesia.

CHARLES E. SHEPARD

**Health Examinations** — By the Special Committee on Preventive Medicine of the New York County Medical Society. 1945 ed. 144 pp. *Pocket Manual*, 3½ x 7½ in. Free from publisher.

When the House of Delegates of the American Medical Association in 1922 recommended the routine periodic health examination as a practical contribution to preventive medicine, an important new door was opened to physicians for public service. This new edition of the New York County Medical Society's manual for the general practitioner is a useful aid to the examining physician.

It considerably clarifies the technique

of some of the less well known features of these examinations, and will considerably extend for most physicians the field of inquiry. It also gives significant help in interpretation of findings. These examinations become more comprehensive and meaningful under the guidance of the eighteen experts who have written the fourteen chapters comprising the book.

These chapters are separately devoted to the premarital examination, the infant, the child under six, the school age child, with an excellent special chapter devoted to the emotional development before adolescence, and another chapter covering the psychological aspects during adolescence. The adult is considered in the three age periods—youth, middle age, and senescence—with a special writer taking up each aspect of the subject.

If general practitioners would seriously study the information this little book contains, their work in detecting the presence and cause of health frailties and the early signs of significant disease would be greatly enriched.

J. G. VAUGHAN

**Proceedings of the Conference on Preventive Medicine and Health Economics**—University of Michigan. Ann Arbor, Mich.: University of Michigan, 1947. 245 pp. Free.

In the early fall of 1946, teachers of preventive medicine from most of the medical schools of the United States and Canada met at the University of Michigan. Drs. John Grant and Alan Gregg of the Rockefeller Foundation with their opening presentations of "Toward Health—Certain Trends," and "Transition in Medical Education," vitalized the issues that are facing us in medicine today. The first half of the conference was given over to the subject of the teaching of preventive medicine. The formal papers, discussion, and committee reports dealt with the

points of view relative to philosophies and objectives as well as with content and teaching methods.

The remainder of the conference was devoted to the subject of health economics which was presented under the following headings:

1. The Developing Field of Health Economics
2. Educational Needs in Health Economics
3. Health Economics in the Medical Curriculum
4. Problems of Personnel

As a consequence of the varied background and experience of the teachers of preventive medicine, many points of view were brought to bear on the problems presented. Crystallization and rigid definition were not achieved, attempted or desired. The members of the conference, however, had their first real opportunity to learn what was being done elsewhere and to compare and evaluate their own programs with those of their confreres in other parts of the country. Equally important was the consideration of the developing field of health economics and the possible rôles of the teacher of preventive medicine in teaching this subject.

In a review such as this, it is impossible to list the papers presented or to summarize and review them critically. The proceedings have been widely distributed. A careful study of the material is distinctly worth while for those interested in teaching preventive medicine and health economics.

LLOYD FLORIO

#### Nursing Care in Chronic Diseases

—By *Edith L. Marsh, R.N., S.C.M.*  
*Philadelphia: Lippincott, 1946. 237 pp. Price, \$3.00.*

The kernel of this valuable little book lies in this sentence: "It is necessary to create opportunities for those chronically ill people who may still be useful to themselves and the community, and to give the benefit of excellent nursing care and expert medical attention to

those patients whose chronic illness means hospitalization." It is dawning on the medical and nursing professions, the author points out, that "care of chronic illness is more than merely making patients comfortable for the rest of their days."

Miss Marsh then proceeds to tackle the whole problem of home, foster home, and boarding home care as well as hospital service for the chronically ill. She presents ways of making these services more effective, bringing out the point that this group needs companionship, supportive measures, such as physical and occupational therapy, good food, and recreation.

The nursing care of special conditions comprises the main part of this book and is realistic, helpful, and simply described. Public health nurses as well as nurses in private practice will find these chapters worth reading in view of the growing load of elderly patients. The practical suggestions resulting from Miss Marsh's wide experience are worth adopting.

The outstanding quality of this book, however, is its spirit which gives the reader lessons not only in enlightened nursing care, but in sympathetic understanding of those whose physical or mental activities, or whose days of life, are limited. It is a good book for a nurse to own.

This reviewer regrets that Miss Marsh did not describe the place, training, and supervision of the practical nurse (or attendant) in the care of the chronically ill.

DOROTHY DEMING

#### How Can We Teach about Sex?—

By *Benjamin C. Gruenberg.* *New York: Public Affairs Committee, 1946. 32 pp. Price, \$.10.* (A special edition published for the American Social Hygiene Association is available at 10 cents at the Association's headquarters, 1790 Broadway, New York 19, N. Y.)

Here is a useful and inexpensive out-

line of basic concepts and practices in a widely misunderstood field. Controversies over who should be responsible for sex education of youth—the home, church or school—have been allowed to obscure the generally agreed on thesis that sound education and guidance in the wise use of sex are essentials. As a result, far too little has been or is being done by any or all of the three logical agencies.

Authorities concur in the belief that the home should be the primary source for this training, but that school and church should furnish valid and usable supplemental facts and philosophy along scientific and ethical lines. They also agree that isolated courses designated as "sex hygiene" or "social hygiene" are undesirable and that curricular efforts should be to integrate, i.e., to deal with problems having sexual connotations in whatever courses those problems naturally arise. Biology, botany, home economics, health and physical education, and all of the newer sociological courses such as those designated "family life," "human relationships," *et al.* are good examples.

Gruenberg is one of the leaders and pioneers in developing the fundamental thinking and practices of sex education. Along with Balliet, Bigelow, Exner, Galloway and their confreres, he has contributed several text and source books to the growing armamentarium available for school and home use. This most recent of his publications was subjected to wide consideration, discussion and criticism by many of his colleagues during its writing and re-writing. The resulting essence is a readable, stimulating and utilitarian summary.

RAY H. EVERETT

**Nutrition and Diet Therapy, A Textbook of Dietetics—By Fairfax T. Proudfit and Corinne Hogden Robinson. (9th ed.) New York: Macmillan, 1946. 782 pp. Price, \$3.75.**

This ninth edition of a well known nursing text has a number of new features to enhance its value for students in schools of nursing, and as a reference book for graduate nurses and dietitians. The book is arranged in five sections—as follows: "Normal Nutrition," "Normal Nutrition in Special Conditions," "Diet Therapy," "Practical Applications of Nutrition: Elementary Cookery," and "Recipes." An appendix containing suggested course outlines, dietary case study outline, food composition tables, and other tables adds to the usefulness of the book. A new chapter, "Feeding the Aged," gives consideration to the special needs of an ever increasing proportion of our population, and presents many sound and practical guides for their diet.

The bibliography at the close of each chapter has been brought up to date. The projects and review questions included place emphasis on a normal diet and optimum nutrition for all.

HAROLD R. SANDSTEAD

**Negro Housing Needs—By Joseph H. Bunzel. Pittsburgh, Pa.: Pittsburgh Housing Association, 1946. 32 pp. Price, \$.50.**

This monograph is concerned not only with a study of Negro housing needs in Pittsburgh and Allegheny County, but also with possible solutions to meet these needs. The author has tackled this problem of housing in an attempt to find objective and factual data to support the many general statements which are made about housing for Negroes. He does this not only by using Bureau of the Census material, but also by block studies, estimates of costs, population changes, the employment picture and studies made by such agencies as the National Housing Agency and War Housing Center. Thus he has facts to support such statements as: (a) twice as many of the housing

units for Negroes as for whites are substandard; (b) among Negro tenants, there are a greater number of large families than among the white population; (c) private enterprise has made few dwelling units available to the Negro population in the preceding 5 years; (d) the average rent paid by Negroes is higher for accommodations far inferior to those procured by whites; and (e) Negroes of low income need more bedrooms than white families of similar economic status. Incidentally, as a result of this study, the author suggests that in the 1950 Census, both the number of rooms and bedrooms be taken into consideration in order to facilitate realistic and comparative housing statistics.

The suggestions for solution of the needs indicated made by the author are sound and in keeping with accepted practices. This booklet should serve as a guide to other communities interested in this problem. It also may be used to advantage by public health workers, social workers, and community leaders.

Unfortunately the booklet is mimeographed and paper covered. Some of the tables could have been much more attractively arranged; and in certain sections the writing could have been more polished. The reviewer also has an emotional quirk which makes him object to the title "Negro Housing" just as he objects to "Negro health" and "Negro churches."

PAUL B. CORNELLY

**Aging Successfully** — By George Lawton. New York: Columbia University Press, 1946. 266 pp. Price, \$2.75.

Are you growing older? Do you pretend that growing older is something that happens to someone else, or are you willing to accept the ultimate fact? If you want to "get on" successfully, this book is a good prescription ad-

ministered to you in mild and tasteful dosage. It is not about sick old people but rather about just people who grow older with all their existing complexes and psychological problems. The author presents his formula from a background of rich experience as student of gerontology and as a psychological counselor on problems of maturity. His style is charming and his message is optimistic. The book is happily free from terrifying statistics on why old people get sick and die, and is devoted rather to how aging minds can do so successfully. The ten hints given in the Epilogue are golden rules of behavior for those who wish to grow older successfully. CHARLES E. SHEPARD

**Facts About Nursing, 1946**—(9th ed.)—New York: Nursing Information Bureau, 1946. 112 pp. Price, \$.35.

"All who read, write, speak or think about nurses and nursing" will find essential and authoritative statistical information in this, the ninth, edition of the nursing profession's yearbook. Nurses constitute the largest occupational group working for health, and in 1945 added 50,000 new members licensed to practise under state law. Teachers only exceed their numbers among all occupations for women. A yearbook is therefore, amply justified.

Some of the facts about public health nursing do not present as bright a picture as the overall statistics would lead one to expect. There were only 20,672 public health nurses counted in 1946, and only 5,633 of these, or about 28 per cent, had completed a year or more of study in an approved public health nursing program. (Perhaps further study of the statistical tables of comparable salaries would offer one explanation of this.) It is also noted that there were still 1,133 counties in the United States and 23 cities without public health nursing services in 1946.

This is just a sample of the thought-provoking figures supplied by the yearbook. One can learn how many nurses there are, where they are employed, what they are paid, something of the personnel policies in force in their lines of employment, but what they *do*—how many patients they care for, visits they make, how much time they spend on duty—these facts are left to the imagination. Will the time ever come when a yearbook can give the reverse of the picture—the summary of services rendered to the American people by this stupendous working force?

DOROTHY DEMING

**The Social Work Year Book—**  
By Russell M. Kurtz. (9th ed.) New York: Russell Sage Foundation, 1947. 714 pp. Price, \$3.50.

This encyclopedia of social welfare interest and activity includes 79 articles by six authors. Besides being a handbook of current information about activities in various related fields for the professional worker, the volume gives the non-professional reader an understanding of the social problems that challenge citizen attention, and of the programs devised to deal with them. A significant development noted by the authors is the growth in services due both to new needs created by the war

strains and to increased understanding by the public of the value of social services. Shortages of professional personnel have made it impossible for most agencies to meet the demands for service.

Coverage is limited to the United States except in three articles: Canadian Social Work, which is included for the first time, International Social Work, and Foreign Relief and Rehabilitation.

Wilson G. Smillie, M.D., writes cogently on public health, outlining the respective functions of local, state, and federal governments in providing standard health services. Included also is a picture of public health in the post-war period—the new concept of the advantages of nation-wide coördinated research, as well as the recognized need for an organized prepayment plan for family care to replace the “fee-for-service” basis if the average man is to secure adequate preventive and clinical care.

The book also includes a list, with brief descriptions, of 442 national voluntary and 79 governmental agencies in the United States.

This is an invaluable tool for the public health worker no less than for the worker in many related fields. It is, besides, much more thrilling than its prosaic title. MARTHA LUGINBUHL

## BOOKS RECEIVED

*Listing in this column acknowledges the receipt of books and our appreciation to the senders. Space and the interests of readers will permit review of some, but not all, of the books listed.*

ANNUAL REPORT OF THE FEDERAL SECURITY AGENCY (Section Six). Social Security Board. Washington: U. S. Gov. Ptg. Office, 1947. pp. 423–533. Price, \$.25.

APHASIA: A GUIDE TO RETRAINING. By Captain Louis Granich. New York: Grune & Stratton, 1947. 108 pp. Price, \$2.75.

CHILD-LABOR-ON-FARMS PROGRAM IN OPERATION DURING SUMMER SEASON, 1946. Report by New York State Department of

Labor and sponsored jointly by New York State Farm Labor Operating Committee. 99 pp. Free from above (80 Centre Street, New York City).

ETHICS—WITH SPECIAL APPLICATION TO THE NURSING PROFESSION. By Joseph B. McCallister, Ph.D. Philadelphia: Saunders, 1947. 442 pp. Price, \$2.75.

FUNDAMENTALS OF CLINICAL NEUROLOGY. By H. Houston Merritt, M.D., Fred A. Mettler,



- M.D., Ph.D., and Tracy Jackson Putnam, M.D. Philadelphia: Blakiston, 1947. 289 pp. 96 illus. Price, \$6.00.
- THE FUTURE OF HOUSING. By Charles Abrams. New York: Harper & Brothers, 1946. 428 pp. Price, \$5.00.
- GROWING HEALTHFULLY—A TEACHING UNIT FOR GRADES I-XII (revised 1946). By Mabel E. Rugen, Ph.D. New York: National Tuberculosis Association, 1946. 13 pp. Available from state and local tuberculosis associations.
- HEATING VENTILATING AIR CONDITIONING GUIDE 1947. Vol. 25. New York: American Society of Heating and Ventilating Engineers, 1947. 1282 pp. Price, \$6.00.
- HOME ECONOMICS. By Kathyryne T. Healey. Boston: Bellman Publishing Company, Inc., 1946. 24 pp. Price, \$.75.
- INTERNATIONAL HEALTH CONFERENCE. NEW YORK, N. Y., JUNE 19 TO JULY 22, 1946. Report of the United States Delegation Including the Final Act and Related Documents. Department of State. Washington: U. S. Gov. Ptg. Office, 1947. 145 pp. Price, \$.35.
- LABORATORY CONTROL OF WATER PURIFICATION. By Charles R. Cox. New York: Case-Sheppard-Mann Publishing Corp., 1946. 386 pp. Price, \$4.00.
- LET'S TEACH DRIVING—AN ADMINISTRATIVE GUIDEBOOK. Washington: National Commission on Safety Education of the National Education Association, 1947. 135 pp. Price, \$.50.
- MANUAL FOR SEWAGE PLANT OPERATORS. Prepared by Texas Water Works and Sewerage Short School. Lancaster, Pa.: Lancaster Press, Inc., 1946. 435 pp. Price, \$3.50.
- NATIONAL HEALTH INSURANCE IN GREAT BRITAIN 1911-1946. By R. W. Harris. London: George Allen and Unwin, Ltd., 1946. 224 pp. Price, \$3.25.
- NUTRITION IN INDUSTRY. International Labor Office, Washington and Montreal. 1947. 177 pp. Price, \$1.50.
- NUTRITION REVIEWS. Vol. 4, Nos. 1-12. Published by The Nutrition Foundation, New York, N. Y. 1946. 379 pp. Price, \$2.00 per year.
- OLD PEOPLE—Report of a Survey Committee on the Problems of Ageing and the Care of Old People. Under the chairmanship of B. Seebohm Rowntree. London: Oxford University Press, 1947. 202 pp. Price, \$1.50.
- PHARMACOPOEIA OF THE UNITED STATES OF AMERICA. 13th revision. Easton, Pa.: Mack Publishing Co., 1947. 957 pp. Price, \$8.00.
- PHYSICAL FITNESS WORKBOOK. By Thomas Kirk Cureton, Ph.D. St. Louis: Mosby, 1947. 150 pp. Price, \$2.50.
- POSTGRADUATE MEDICAL EDUCATION COURSE OUTLINE BOOK 1946-1947. Council Committee on Public Health and Education. Syracuse: Medical Society of the State of New York. 88 pp.
- PRACTICAL NURSING—An Analysis of the Practical Nurse Occupation with Suggestions for the Organization of Training Programs. Federal Security Agency, Office of Education. Washington: U. S. Gov. Ptg. Office, 1947. 144 pp. Price, \$.55.
- PROCEEDINGS AND PAPERS OF THE 15TH ANNUAL CONFERENCE OF THE CALIFORNIA MOSQUITO CONTROL ASSOCIATION. Edited by Harold Farnsworth Gray. Issued by the Association, 1946. 154 pp. (mimeo.).
- PUBLIC WORKS ENGINEERS' YEARBOOK 1946. Chicago: American Public Works Association, 1946. 252 pp.
- RECENT PROGRESS IN HORMONE RESEARCH—Proceedings of the Laurentian Hormone Conference. Edited by Gregory Pincus. New York: Academic Press, 1947. 377 pp. Price, \$7.50.
- RUSSIAN-ENGLISH TECHNICAL AND CHEMICAL DICTIONARY. By Ludmilla Ignatiev Callahan. New York: Wiley, 1947. 794 pp. Price, \$10.00.
- SEWERAGE AND SEWAGE TREATMENT. By Harold E. Babbitt. (6th ed.) New York: Wiley, 1947. 692 pp. Price, \$6.50.
- STATE-LOCAL RELATIONS—Report of the Committee on State-Local Relations. Chicago: Council of State Governments, 1946. 228 pp. Price, \$3.50.
- A SURGEON'S DOMAIN. By Bertram M. Bernheim, M.D. New York: Norton, 1947. 253 pp. Price, \$3.00.
- TEMPORARY DISABILITY INSURANCE COORDINATED WITH UNEMPLOYMENT INSURANCE. Prepared by Bureau of Research and Statistics and Bureau of Employment Security. Washington: Social Security Administration, 1947. 32 pp. Free.
- THERAPEUTIC EXERCISE. By F. H. Ewerhardt, M.D., and Gertrude F. Riddle, R.N. Philadelphia: Lea & Febiger, 1947. 152 pp. Price, \$2.50.
- TUBERCULOSIS HOSPITAL PLANNING AND CONSTRUCTION. By J. Bruno Basil. New York: National Tuberculosis Association, 1946. 81 pp. Price, \$1.00.

## A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

**Cautious Progress**—BCG vaccination was scrutinized by a select committee of experts who recommended that a study be made—and begun this year—of the value of prophylaxis in several exposed groups, among them hospital staffs. For the present it was recommended that the vaccine be not furnished to general practitioners for use with individual patients. More research is needed, the committee decided.

ANON. Report of a Conference on BCG Vaccination. *Pub. Health Rep.* 62, 10:346 (Mar. 7), 1947.

**In Lieu of the Poor-Farm**—British M.O.H.'s consider the addition of geriatrics to their public health services. Suitable housing for the able; hostels for those with minor mental or physical infirmities; hospitals for the chronic sick among the aged—these are the facilities proposed.

ALLISON, S. F. The Welfare of Old People. *J. Roy. San. Inst.* 57, 2:102 (Mar.), 1947.

**You've Heard of the Capacitron, of Course**—Something new for sanitary inspectors to worry about! It seems that raw food subjected to a flash of penetrating electrons becomes immune to spoilage. The process need not materially increase the cost of the preserved product, say the writers.

BRASCH, A., and HUBER, W. Ultrashort Application Time of Penetrating Electrons. *Science.* 105, 2718:112 (Jan. 31), 1947.

**How Are Your Knackeryards?**—British sanitarians are disturbed over the condition of the places where ancient, or deceased animals are disposed of—to make dog meat apparently. The usual sanitary conditions, as they are described, must be

stomach-turning. Do we have comparable nuisances over here? And if so, who does what about them?

BURROW, H. The Future Control of Abattoirs and Knackeryards. *J. Roy. San. Inst.* 67, 2:95 (Mar.), 1947.

**Anent Measuring Knowledge**—Our own merit system workers delve into the field of public health nurse selection with some special projects. These are discussed in detail which I found absorbing, for I am one of the dogs they try some of their tests on.

DEMING, D., *et al.* Progress in Merit System Unit Examinations. *Pub. Health Nurs.* 39, 2:73 (Feb.), 1947.

**Safe Eating-Out**—To promote balanced eating-place sanitation programs in each state; to stimulate adoption of effective state legislation; and to encourage uniform enforcement through legal and educational measures—these are the aims of U.S.P.H.S. restaurant sanitarians.

FUCHS, A. W. Restaurant Sanitation Program of the United States Public Health Service. *Pub. Health Rep.* 62, 8:261 (Feb. 21), 1947.

**Finger Pointed at Mice**—More about New York's new disease—rickettsialpox. Usually mistaken for atypical chickenpox, it was just called a fever or rash of unknown origin. Rickettsias were isolated from patient's blood and parasites of mice.

GREENBERG, M., *et al.* Rickettsialpox—a Newly Recognized Rickettsial Disease. *J.A.M.A.* 133, 13:901 (Mar. 29), 1947.

**Another Reminder to Go Slow**—Anaphylactic shocks following injections of typhus (chick-embryo) vaccine are reported. It is recommended that *all*

candidates for chick-embryo vaccines be tested, or questioned, for sensitivity.

HAMPTON, S. F. Anaphylactic Shock in Egg-Sensitive Individuals Following Vaccination with Typhus Vaccine. *J. Lab. & Clin. Med.* 32, 2:109 (Feb.), 1947.

#### Good News for Epidemiologists—

Two reports on the use of penicillin against scarlet fever agree that it works. Says one, "penicillin therapy resulted in a prompt fall in temperature, a decrease in toxicity, and a decided reduction in the incidence of pyogenic complications and of the carrier state." Says the other "fewer complications followed its use."

HIRSH, H. L., *et al.* Penicillin Therapy in Scarlet Fever. (and) HOHNE, A. L., and BROWN, R. H. Penicillin for Scarlet Fever. *J.A.M.A.* 133, 10:661 (Mar. 8), 1947.

**One Tooth Tells—**General prevalence of caries, and the proportion of children who have one, or more, carious teeth are closely related. This fact permits of a reliable and rapid method of evaluation for dental preventive programs. A dentist and a clerk can cover a lot of ground in one week.

KNUTSON, J. W., *et al.* Simplified Appraisal of Dental-Health Programs. *Pub. Health Rep.* 62, 12:413 (Mar. 21), 1947.

#### This Will Discourage You—

Among malnourished patients the decayed-missing-or-filled teeth were only a third of those in a control group of well nourished patients. This finding doesn't do much to aid or comfort those of us who teach that the way to good teeth is via the vitamin-filled dinner pail, does it?

MANN, A. W., *et al.* A Comparison of Dental Caries Activity in Malnourished and Well-Nourished Patients. *J. Am. Dent. A.* 34, 4:244 (Feb. 15), 1947.

**Vector Control Is Indicated—**Current scientific opinion about rabies,

psittacosis, and arthropod-borne encephalitis is reviewed to good effect. Did you know that a single anti-rabies vaccination will do for dogs, but cats should get three? Did you know that ducks may have psittacosis? Did you know that equine encephalitis is most common among children under 5? If you are as uninformed as I was in these matters then you will do well to read this paper, too.

MEYER, K. F., and EDDIE, B. Human Virus Infections of Animal Origin. *J.A.M.A.* 133, 12:822 (Mar. 22), 1947.

**Forum on the Future—**It seems that the (British) National Health Service Act will play hob with local health administrative agencies. In a series of gloomy papers a number of English M.O.H.'s discuss the reorientation of preventive medicine and local government functions which the new program will entail. National social services have a way of coming to life in our country about two decades after they are adopted in England, so you may find something prophetic in this symposium.

THOMAS, E. W. C. The Act and the M.O.H. of a "Minor Authority" (and six related papers). *Pub. Health.* 60, 5:93 (Feb.), 1947.

**For Your Own Comfort—**In tropical heat, if any clothing must be worn, it should be loose fitting, light weight, expose as much skin as possible, and provide maximum ventilation. Close-fitting, absorbent garments had been suggested but the investigators turned thumbs down. I was sure you'd like to have your layman's opinion confirmed by science.

YAGLOU, C. P., and RAO, M. N. Loose Versus Close-fitting Clothing for Work in "Tropical Heat." *J. Indust. Hyg. & Toxicol.* 29, 2:140 (Mar.), 1947.

# ASSOCIATION NEWS

## APPLICANTS FOR MEMBERSHIP

*The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.*

### *Health Officers Section*

- F. Walter Bliss, LL.B., Schoharie, N. Y., President, Schoharie County Board of Health
- Maxwell Bowman, M.D., D.P.H., 137 E. Thelbert St., Winnipeg, Man., Canada, Director, Preventive Medical Services, Provincial Dept. of Health and Public Welfare
- James G. Capossela, 1711 New York Ave., N.W., Washington, D. C., Administrator, The Central Dispensary and Emergency Hospital
- Agenor Carle, M.D., Dept. of Public Health, Vieques, Puerto Rico, Medical Officer
- John F. Conlin, M.D., 121 Park Drive, Boston 15, Mass., Director, Medical Information and Education, Massachusetts Medical Society
- William F. Conrad, M.D., M.P.H., 6372 W. 83rd St., Los Angeles 45, Calif., District Health Officer, Los Angeles County Health Dept.
- Guy H. Faget, M.D., U. S. Marine Hospital, Carville, La., Medical Director, U.S.P.H.S., Medical Officer in Charge
- Lt. Paul R. Foote, M.C., Miyagi Military Government Team, APO 547, San Francisco, Calif., Public Health Officer
- James M. Gordon, M.D., 1400 Bixby St., Ardmore, Okla., Director, City-County Health Unit
- Gustave A. Gorisse, M.D., 567 Moss Ave., Peoria, Ill., Director of Communicable Diseases and Venereal Disease Control, City Board of Health
- Lionel A. Greco, M.D., Bonnie Burn Sanatorium, Scotch Plains, N. J., Resident Physician
- S. Guzman, Jr., M.D., Calzada de Tacubava 26, Mexico, D.F., Mexico, Health Director, Dept. of Public Health
- Percy Harris, M.D., Health Officer, Scottsville, Va.
- Raymond O. Hitchcock, M.D., 15 S. Main St., Alfred, N. Y., Local Health Officer
- Arthur J. Ledoux, M.D., City Hall Annex, Fall River, Mass., Health Commissioner
- Chia-chi Ma, M.D., 8 University Place, New Haven, Conn., Head, Dept. of Preventive Medicine, Chinese Army Medical Center
- William B. Meister, M.D., Territorial Health Dept., Honolulu, T.H., Director, Bureau of Medical Services
- Antonio P. Milone, M.D., 4354 Washington St., Boston 31, Mass., Medical Inspector, City of Boston
- Benjamin C. Pier, D.V.M., 2800 Devonshire Place, N.W., Apt. 104, Washington, D. C., Chief, Poultry Inspection Section, Production and Marketing Administration, U. S. Dept. of Agriculture
- Fernando Pimentel de Moura, M.D., 59 Marechal Floriano, Salvador-Est. Bahia, Brazil, S.A., Head, Setor Espirito Santo, Servico Especial de Saude Publica
- Juan A. Pons, M.D., Dept. of Health, San Juan, Puerto Rico, Commissioner of Health of Puerto Rico
- Eustace H. Prescott, M.D., Dept. of Health, 815 Hemlock St., Macon, Ga., Asst. Health Officer, Macon-Bibb County Health Dept.
- Maurice A. Priest, M.D., 15 Sewall St., Augusta, Me., District Health Officer
- Val W. Rapp, M.D., Fort Belknap Reservation, Harlem, Mont., Medical Officer in Charge
- Alvin Renner, M.D., Bellevue Hospital, 26th St. and 1st Ave., New York 16, N. Y., Director, Employees Health Service
- Harold H. Ring, M.D., Box 129, Albany, Ga., Consultant on Maternal and Child Health, State Dept. of Health
- Charles G. Sheppard, M.D., Hutchinson, Minn., Health Officer
- Edgardo R. Silva, M.D., Brumbaugh 29, Rio Piedras, Puerto Rico, Head Medical Officer, Public Health Unit
- Jose M. Silva, M.D., P. O. Box 131, Coamo, Ponce, Puerto Rico, Head Medical Officer, Puerto Rican Health Dept.
- Joseph B. Stocklen, M.D., 1747 Eddy Rd., East Cleveland, Ohio, Controller of Tuberculosis, Sunny Acre Sanatorium
- K. W. Thum, M.D., Main St., Town Hall, West Orange, N. J., Health Officer
- Herbert T. Wagner, M.D., 4421 Xavier, Denver, Colo., Surgeon (R), U. S. Public Health Service
- Milton Werrin, V.M.D., 408 S. 20th St., Philadelphia, Pa., Supervising Meat Inspector, Dept. of Health

Homer V. Wilburn, M.D., 426 E. 51st St., Chicago, Ill., Medical Director, Provident Hospital

#### *Laboratory Section*

Marguerite Beatty, 312 D. Wai Naui Way, Honolulu, T.H., Biological Laboratory Administrator, Dept. of Health

Leon A. Bradley, Ph.D., Marshall Hall, Mass. State College, Amherst, Mass., Head, Dept. of Bacteriology and Public Health

Harold N. Carlisle, M.S., Ohio State Univ., Dept. of Bact., Columbus, Ohio, Junior Research Fellow, National Institute of Health

Maurice D. Cook, M.S., 3101 S. 6th St., Springfield, Ill., Bacteriologist, Diagnostic Laboratories, State Dept. of Public Health

Calvin E. Corcy, M.A., 2111 S. 15th St., Springfield, Ill., Bacteriologist, Diagnostic Laboratories, State Dept. of Public Health

Cretyl I. Crumb, M.S., 208 S. 43rd St., Philadelphia 4, Pa., Research Asst., Univ. of Pennsylvania

Marilyn L. C. Culberson, 33-34 104th St., Corona, N. Y., Junior Bacteriologist, New York City Board of Health

Virginia N. Darroch, M.A., 1215 N. Penn. 304, Indianapolis, Ind., Chief Serologist, State Board of Health

Mary A. Donoghue, M.P.H., 65 Park Drive, Apt. 3, Boston, Mass., Junior Bacteriologist, State Dept. of Public Health

Virginia B. Douglas, 941 E. Division, Springfield, Mo., Junior Biologist, State Division of Health

Harry J. Erickson, 24 S. 5th St. East, Salt Lake City, Utah, Interested Citizen

Elizabeth V. Frazee, 208 N. Romine St., Urbana, Ill., Bacteriologist, State Dept. of Public Health

William E. Fry, Jr., 412 Rafter, Springfield, Ill., Serologist, State Dept. of Public Health

Chester Garwood, 612 S. 2nd, Springfield, Ill., Serologist, State Dept. of Public Health

Rachael H. Gorrie, M.S., 698 Pineleaf St., Montgomery 6, Ala., Bacteriologist, U. S. Public Health Service, Virus Laboratory

R. Travis Hill, Tucson Medical Center, Box 5158, Tucson, Ariz., Medical Technologist

William W. James, 128 W. Jefferson St., Springfield, Ill., Laboratory Technician, State Dept. of Public Health

Marie Louise Koch, M.S., 15 W. Mt. Vernon Place, Baltimore 1, Md., Student, Johns Hopkins Univ., School of Hygiene and Public Health

Lisbeth M. Kraft, D.V.M., State Dept. of Health, Div. of Labs., New Scotland Ave., Albany 6, N. Y., Asst. Bacteriologist

Philip B. Miner, M.S., 249 Belmont St., Health Dept. Lab., Worcester 5, Mass., Bacteriologist-Serologist

Nelson P. Moyer, State Board of Health, Jacksonville, Fla., Laboratory Technician

Hyman Nadel, M.S., 2180 Holland Ave., New York 60, N. Y., Student, Univ. of Illinois

Elizabeth C. Netto, New Jersey College for Women, Bact. Dept., New Brunswick, N. J., Research Asst.

Janet Y. Oishi, 2728 Hillside Ave., Honolulu 54 Oahu, T.H., Bacteriologist, Dept. of Parasitology, Univ. of Hawaii

Frances E. Page, State Health Laboratory, Montgomery, Ala., Senior Serologist, State Health Dept.

Margaret T. Powers, 16 Laguna St., San Francisco 2, Calif., Bacteriologist, City Dept. of Public Health

H. Preston Price, M.D., 317 Hamilton Rd., Ridgewood, N. J., Asst. Pathologist, Jersey City Medical Center

Margaret B. Rowan, M.A., 342 Beechwood Rd., Ridgewood, N. J.

Nathan J. Schneider, 715 Ralph St., Jacksonville, 4, Fla., Junior Asst. Bacteriologist, State Board of Health

John M. Slack, Ph.D., West Virginia Univ., School of Medicine, Morgantown, W. Va., Head, Dept. of Bacteriology and Public Health

Florence E. Smith, 526 E. Fall Creek Parkway, Indianapolis, Ind., Public Health Trainee, State Board of Health

Louie C. Smith, Good Samaritan Hospital, West Palm Beach, Fla., Laboratory Technologist

William T. S. Thorp, D.V.M., National Institute of Health, Bethesda 14, Md., Veterinary Pathologist, Pathology Laboratory

Evelyn B. Wallraff, M.S., Univ. of Arizona, Dept. of Bact., Tucson, Ariz., Asst. Professor of Bacteriology

Glen C. Weber, M.S., 1098 W. Michigan St., Indianapolis 7, Ind., Chemist, Bureau of Laboratories, Division of Food and Drugs, State Board of Health

#### *Vital Statistics Section*

Albert E. Bailey, Ph.D., 4719 B. Homer Ave., S.E., Washington, D. C., Chief, National Consulting Service, National Office of Vital Statistics

George Boyer, Dept. of Health, Div. of V. S., Montreal, Que., Canada, Statistician

Antonio Ciocco, D.Sc., U. S. Public Health Service, Washington, D. C., Deputy Chief, Div. of Public Health Methods

- Eleanor C. Connolly, 350 E. 53rd St., New York, N. Y., Asst. Statistician, National Tuberculosis Assn.
- Irene F. Conrad, M.A., 303 Chamber of Commerce Bldg., Nashville 3, Tenn., Exec. Secy., Council of Community Agencies
- Mardelle L. Clark, 4509 Elm, Chevy Chase 15, Md., Chief, Analysis Section, Army Institute of Pathology
- John H. Doughty, Div. of Vital Statistics, Parliament Bldgs., Victoria, B. C., Canada, Senior Statistician
- Raymond Flamand, Dept. of Health, Div. of V. S., Montreal, Que., Canada, Statistician
- Bernard Frank, 615 N. Wolfe St., Baltimore 5, Md., Statistician, Div. of Vital Statistics, State Dept. of Public Health (Illinois)
- Minnie A. Galloway, 314 Depot St., Shelbyville, Tenn., Principal Stenographer and District Clerk, State Dept. of Public Health
- Vianney Grandmaison, Dept. of Health, Montreal, Que., Canada, Chief of Staff, Division of Vital Statistics
- William M. Haenszel, M.A., State Dept. of Health, Hartford, Conn., Statistician, Bureau of Vital Statistics
- Jean L. Hall, M.S.P.H., U. S. Public Health Service, Washington 14, D. C., Statistician, Venereal Disease Division
- Samuel C. Newman, Ph.D., National Office of Vital Statistics, Washington 25, D. C., Chief, Marriage and Divorce Statistics Section
- Zebbie E. Oswalt, 1512 Central St., Jackson, Miss., Field Representative, State Board of Health
- Sim B. Shattuck, 6236 Curie St., New Orleans, La., Director, Bureau of Vital Records, City Health Dept.
- Stillman P. Williams, 449 W. Peachtree St., Atlanta, Ga., Exec. Director, Migratory Labor Health Assn.
- Charles P. Winsor, Ph.D., 615 N. Wolfe St., Baltimore 5, Md., Asst. Professor of Biostatistics, School of Hygiene and Public Health, Johns Hopkins Univ.
- Harry F. Edinger, M.S., 61 Albany Ave., Kingston, N. Y., Director of Environmental Sanitation, Ulster County Dept. of Health
- Arthur F. Geib, 2709 17th St., Bakersfield, Calif., Supt., Dr. Morris Mosquito Abatement District
- Wilfred C. Gilbert, Mass. Inst. of Technology, Graduate House, Cambridge 39, Mass., Student
- Kenneth V. Hill, 220 S. State St., Chicago 4, Ill., Partner, Greeley and Hansen, Consulting Sanitary Engineers
- Joseph Hirshstein, 1783 E. 11th St., Cleveland 11, Ohio, Pres., Josam Manufacturing Co.
- Albert H. Johnson, 1145 Chickasaw, Paris, Tenn., Reservoir Sanitary Engineer, Health and Safety Dept., Tennessee Valley Authority
- Calvin C. Kiker, C.E., Health and Safety Dept., TVA, Wilson Dam, Ala., Chief Engineer, Malaria Control Division
- John H. Lair, 300 Public Safety Bldg., Seattle, Wash., Senior Sanitarian, Seattle Dept. of Public Health
- Kenneth A. Lake, C.E., 620 Colorado Bldg., Denver, Colo., Consultant Hospital Architect-Engineer, U. S. Public Health Service
- Peter G. Larsen, 1944 North Richmond St., Chicago 47, Ill., Director, City Dairy Inspection, Dept. of Health
- Frank R. Liguori, 86 Oxford St., Cambridge, Mass., Student, Harvard University, School of Public Health
- Celestino Matta-Dueno, Urbanizacion "El Vedado" Victoria and Bernabe St., Hato Rey, Puerto Rico, District Supervisor, Farmer's Home Administration
- James A. McCullough, M.S.P.H., Avenida Rio Branco 251,12 Caixa Postal 1530, Rio de Janeiro, Brazil, S.A., Sanitary Engineer, Institute of Inter-American Affairs
- John H. McGrann, 69 Wendell St., Cambridge, Mass., Student, Harvard University, School of Public Health
- E. Park McKibben, Spalding County Health Dept., Griffin, Ga., Sanitarian
- Edward McLarty, 6066 Cashio St., 35, Los Angeles, Calif., Sanitary Inspector, Los Angeles County Health Dept.
- H. H. McMillan, 1525 Euclid St., Santa Monica, Calif., Chief Area Inspector, Los Angeles County Health Dept.
- Herman Monefeldt-Hosta, Box 303, Hato Rey, Puerto Rico, Student, School of Tropical Medicine
- Filiberto Montaluo, No. 6 McKingley St., Mayaguez, Puerto Rico, Student, School of Tropical Medicine
- William C. Miller, Jr., 610 S. Canal St.,

#### *Engineering Section*

- Joseph A. Boyer, M.S., 452 South Water, Olathe, Kan., Public Health Engineer, U. S. Public Health Service, Dist. No. 7
- Charles T. Carnahan, C.E., 615 Colorado Bldg., Denver 2, Colo., Public Health Engineer, U. S. Public Service
- Roscoe C. Davis, 703 State Bldg., Los Angeles 12, Calif., Sanitary Inspector, State Dept. of Public Health
- Richard J. Dougherty, 235 Maytide St., Pittsburgh, Pa., Sanitary Engineer, H. J. Heinz Co.

Room 852, Chicago 7, Ill., Senior Asst. Sanitarian (R), U. S. Public Health Service  
 Leo N. Newman, 300 Ferguson Bldg., Cleveland 14, Ohio, with Josam Manufacturing Co.

Isadore Nusbaum, M.S., 2697 Glendale, Detroit 6, Mich., Senior Sanitary Chemist, Detroit Dept. of Water Supply

Robert J. Reed, 170 North Toluca St., Los Angeles 26, Calif., Sanitarian, Los Angeles City Health Dept.

Edward P. Sellner, M.S., Marvin Hall, Room 2, Lawrence, Kan., Assoc. Engineer, Div. of Sanitation, State Board of Health

Woodrow W. Shearin, Warrenton, N. C., Sanitary Inspector, Warren County Dept. of Health

Jose A. Soegaard, Palmer, Puerto Rico, Student, School of Tropical Medicine

Joe A. Stanley, Jr., City Hall, Lubbock, Tex., City Sanitary Engineer

Julian R. Taylor, 531 S. Brady Ave., Newton, N. C., Senior Supervising Sanitarian, Catawba-Lincoln District Health Dept.

Barnie A. Young, City Health Dept., Galveston, Tex., Chief Sanitarian and Assistant Director

#### *Industrial Hygiene Section*

Harry B. Ashe, 2 Colchester Ave., Burlington, Vt., Industrial Hygiene Engineer, State Dept. of Health

Hyman Blocker, 116 Temple St., Los Angeles 12, Calif., Industrial Hygiene Technician, Los Angeles City Health Dept.

John W. Cronin, M.D., 4706 Chestnut St., Bethesda 14, Md., Chief, Federal Employee Health Division, U. S. Public Health Service

Laverne R. Doolittle, 116 Temple St., Los Angeles 12, Calif., Industrial Hygiene Technician, Los Angeles City Health Dept.

Luis Gallardo A., M.D., 104 Asylum St., New Haven, Conn., Director, Tuberculosis Division, Public Health Dept.

William J. Graef, 1217 Harrison Ave., Redwood City, Calif., Supervising Inspector, State Dept. of Public Health

Stanton M. Hardy, M.D., Lederle Laboratories Division, American Cyanamid Co., Pearl River, N. Y., Medical Director

Charles T. Harther, Riverside Drive, Rossford, Ohio, Director of Industrial Relations, National Sanitation Foundation

R. Emmet Kelly, M.D., 1700 South Second St., St. Louis, Mo., Medical Director, Monsanto Chemical Co.

Philip H. Whitman, 1343 Wayne St., Topeka, Kan., Industrial Hygiene Engineer, State Board of Health

#### *Food and Nutrition Section*

Lt. Col. William F. Collins, V.C., Station Veterinarian, Fort Monroe, Va.

Helen C. Conway, M.A., 639 76th St., Brooklyn 9, N. Y., Nutritionist, New York City Health Dept.

Edith E. Coy, 17604 Stansbury, Detroit 21, Mich., Nutrition Director, Detroit Dept. of Health

Maria V. Cruz-Rios, Parque No. 5, Rio Piedras, Puerto Rico, Nutritionist, Dept. of Health

Major Burt W. English, V.C., Station Veterinarian, Station Hospital, Maxwell Field, Ala.

Stanley Glassner, 1152 U. S. Appraisers Bldg., San Francisco 11, Calif., Dining Car Inspector, U. S. Public Health Service

Elizabeth J. Herschede, M.A., 600 Sheridan Ave., Bexley, Ohio, District Nutritionist, State Dept. of Health

Elizabeth M. Knott, M.D., Ph.D., School of Tropical Medicine, San Juan, Puerto Rico, Director of Clinical Research, Dept. of Clinical Medicine

Arthur Lejwa, Netherland Plaza, Cincinnati, Ohio, Scientific Director, Robert Gould Research Foundation

Olga Martinez, M.S., Public Health Unit, Rio Piedras, Puerto Rico, Principal Nutritionist

Floyd M. Miller, 504 S. Olive St., Hammond, La., State Field Supervisor, Division of Milk and Dairy Products, State Dept. of Health

Florence J. Neely, Baltimore City Health Dept., Box 1877, Baltimore 3, Md., Chief, Division of Nutrition

Margaret Louise Newell, State Dept. of Health, Richmond 19, Va., Nutritionist, Bureau of Maternal and Child Health

Marion E. Nichols, 412 Waban Ave., Waban 68, Mass., Nutritionist, Diabetes Section, U. S. Public Health Service

Herbert W. Rathe, M.D., 107-11 3rd St., S.E., Waverly, Iowa, Internist, Roby Memorial Clinic

Selma Swatsburg, 165 Capitol Ave., Hartford, Conn., Nutrition Consultant, State Dept. of Health

Marion Louise Vail, 65 Packard St., S.E., Grand Rapids 6, Mich., Administrative Dietitian, Ferguson-Droste-Ferguson Rectal Clinic and Hospital

Chedwah J. vanTijn, M.S., 46 Willow St., Brooklyn 2, N. Y., Nutritionist, New York City Dept. of Health

#### *Maternal and Child Health Section*

Frances L. Boyle, 37-34 91st St., Jackson Heights, N. Y., Instructor and Supervisor, Cornell University-New York Hospital

Joseph B. Cady, M.D., M.S., The Guthrie Clinic, Sayre, Pa., Chief, Cardiology and Thoracic Medicine, Guthrie Clinic and Robert Packer Hospital

Bessie Draper, R.N., Manteo, N. C., Senior Public Health Nurse, Currituck-Dare District Health Dept.

Juanita Gines de Prosperi, Fournier No. 1, Hato Rey, P. R., Obstetrics Consultant, Nursing Bureau, Health Dept.

Constance V. Jackson, M.D., 81 Wellesley St., Toronto, Ont., Canada, In Charge of Dispensary (Travelling) Clinics, Kangra Mission, India

Francisco Vargas G., M.D., 318 S. Stanton St., El Paso, Tex., Staff Doctor, Well Child Conferences, El Paso City-County Health Unit

Yautung Wang, M.D., Honchonggie, Taipch, Taiwan, China, Director, Taipch Public Health Center

#### *Public Health Education Section*

Gordon W. Allen, Box 555, Pawling, N. Y., Asst. Chief, Community Relations and Research, New York City Veterans Service Center

Jane Austin, 134 Woodrow St., West Hartford, Conn., Student, Department of Public Health, Yale University

George W. Bachman, Ph.D., D.Sc., 722 Jackson Place, N.W., Washington, D. C., Public Health Economics Research, Brookings Institution

Jimmie Bryan, R.N., B.S., 419 West 114th St., New York, N. Y., Student, Teachers College, Columbia University

William J. Burns, LL.B., 2020 Olds Tower, Lansing, Mich., Exec. Secy., Michigan State Medical Society

Betsy D. Conant, A.M., 1026 Chorro St., San Luis Obispo, Calif., Exec. Secy., San Luis Obispo County Tuberculosis Assn.

Beatriz Estela Costa, Arandes 7, Rio Piedras, P. R., Senior Health Educator, Department of Health

Thomas K. Cureton, Jr., Ph.D., 501 E. Washington St., Urbana, Ill., Professor of Physical Education and Director, Physical Fitness Research Laboratory, University of Illinois

Helen H. Dow, R.N., 2200-16th St., N.W., Washington, D. C., Education Assistant, Social Hygiene Society

Friendly Ford, M.A., 602 S. Cheyenne, Tulsa, Okla., Exec. Secy., Tulsa Council of Social Agencies

William S. Groom, 312 West 9th St., Cincinnati 2, Ohio, Director of Health Education, Public Health Federation

Chester E. Hazard, 1575 Filmore St., Denver 6, Colo., Regional Health Services Specialist, Farmer's Home Administration

Frank J. Kihm, 2180 Washington St., San Francisco 9, Calif., Exec. Secy., San Francisco County Medical Society

Frances L. Kraft, Ph.D., C.P.H., National Tuberculosis Assn., 1790 Broadway, New York 19, N. Y., Field Secretary for Pilot Study

Donald H. Lewis, 823 Commerce Bldg., Rochester 4, N. Y., Manager, Rose Extreminator Co.

Mildred L. Martin, R.N., 212 Security Bank Bldg., Kansas City, Kans., Exec. Secy., Wyandotte County Tuberculosis and Health Association

Helen M. Massengale, M.S.P.H., 739 N. Main, Shelbyville, Tenn., Health Educator, Bedford-Marshall District Health Dept.

Ott B. McAtee, M.D., 209 O.P.O. Bldg., Chattanooga, Tenn., Staff Psychiatrist, Health and Safety Dept., Tennessee Valley Authority

Elizabeth A. McMahon, M.S.P.H., 100 N. 8th, Terre Haute, Ind., Health Educator, State Board of Health

Karl R. Miller, 715 South Hope, Los Angeles, Calif., Director of Health and Physical Education, Downtown Y.M.C.A.

Lera O. Neill, Box 296, Peabody College, Nashville, Tenn., Student

Anne H. Phillips, R.N., 152 E. Patriot St., Somerset, Pa., Exec. Secy., Somerset County Tuberculosis Society

Chester A. Purcell, Box 1188, Colorado City, Tex., City Sanitarian

William M. Readey, Room 404, City Hall, Chicago 2, Ill., Plumbing Inspector, City of Chicago

Raymond J. Roenigk, 1600 Louisiana St., Houston, Tex., Physical Director, Houston Y.M.C.A.

Sarah L. Sproles, Bank of Baltimore County Bldg., York Rd. and Penna. Ave., Towson 4, Md., Exec. Secy., Baltimore County Public Health Association

Reed E. Vetterli, LL.B., 63 South 4th East, Salt Lake City, Utah, Member, Board of Directors, Utah State Social Hygiene Association

Pacifico Yap, M.D., 308 Madrid St., Manila, P. I., Resident Physician, Chinese General Hospital

G. Roderick Youngs, M.A., 826 S. Wabash, Chicago 5, Ill., Physical Director, Y.M.C.A.

#### *Public Health Nursing Section*

Muriel E. Anness, R.N., B.S., 1565 Franklin Ave., Mineola, N. Y., Director, Case Finding



- Program, Nassau County Tuberculosis and Public Health Association
- Florence B. Bash, R.N., 1425 West 81, Cleveland, Ohio, Instructor and Student Health Director, St. John's School of Nursing
- Gladys K. Blanks, Route 5, Meridian, Miss., Staff Nurse, State Board of Health
- Esther J. Bronson, 918 E. 76th Terrace, Kansas City 5, Mo., Staff Nurse, Visiting Nurse Association of Kansas City
- Josephine Brown, 711 E. Mansion, Marshall, Mich., Director of Nurses, Calhoun County Health Dept.
- Helen Cameron, R.N., A.B., 930 Poydras St., New Orleans, La., Senior Asst. Nurse Officer, U. S. Public Health Service
- Amy L. Cawley, R.N., B.S., U.S.P.H.S., Box 932, Pharr, Tex., Senior Asst. Nurse Officer, U. S. Public Health Service
- Myrtle M. Devereaux, R.N., 106 E. Alexandrine St., Detroit 1, Mich., Consultant, Social Hygiene Division, City Department of Health
- Ruth I. Ellis, 132 Ardmore Rd., Berkeley 7, Calif., Asst. Director, Nursing Service, Pacific Area, American Red Cross
- Monica Finn, Box 247, Petersburg, Alaska, Public Health Nurse, Territorial Department of Health
- Martha E. Finney, M.P.H., 515 E. Tombigbee St., Florence, Ala., Area Supervisor of Nursing, Tennessee Valley Authority
- Esther C. Gilbertson, State Department of Health, City Hall, Rochester, Minn., Advisory Nurse
- Gladys Girton, 319 Hursley Ave., Sault Ste. Marie, Mich., Supervising Nurse, Chippewa-Luce-Mackinaw Health District
- Mable E. Grover, R.N., M.A., Instructive Dist. Nursing Assn., City Hall, Columbus, Ohio, Exec. Director
- Ruth R. Hall, R.N., B.S., 100 N. Eighth, Terre Haute, Ind., Branch Office Consultant Nurse, State Board of Health
- Dorothy A. Harding, R.N., M.P.H., 1607 S. State St., Ann Arbor, Mich., Health Coördinator, Public Schools
- Ella Hasenjaeger, M.A., Av. Rebougas 476, Sao Paulo, Brazil, S. A., Consultant Nurse, Institute of Inter-American Affairs
- L. Josephine Hawes, M.N., 507 Carondelet St., New Orleans, La., Educational Director, Bureau of Public Health Nursing, New Orleans Health Dept.
- Velma Hay, R.N., 1208 E. 9th, Winfield, Kan., Staff Public Health Nurse, Joint Board of Health
- Beulah L. Heironimus, R.N., B.S., 330 N. Crest, Chattanooga, Tenn., Supervisor, Children's Hospital
- Alice Herzig, R.N., M.A., 2073 Douglas Blvd., Louisville 5, Ky., Senior Asst. Nurse Officer, U. S. Public Health Service
- Elizabeth L. Hodge, M.N., P. O. Box 298, Cordova, Alaska, Staff Public Health Nurse, Territorial Department of Health
- Anna E. Holmes, 507 Rossiter Ave., Baltimore 12, Md., Director of Public Health Nursing, Maryland University Hospital
- Louise L. Holmes, M.A., 838 Arlington St., Jackson, Miss., Field Advisory Nurse, State Board of Health
- Lydia F. Howard, R.N., 1949 Main, Klamath Falls, Ore., Staff Nurse, Klamath County Public Health Dept.
- Atha Howell, R.N., M.A., McAdenville, N. C., Student, Peabody College
- Helen Jean, R.N., B.S., 210 E. Chilhowie Ave., Johnson City, Tenn., Nursing Supervisor, Washington County Health Dept.
- Joseph Keough, 215 Winsor St., Elkhorn, Wis., District Advisory Nurse, State Board of Health
- Marie Kohler, Box 96, Anchorage, Alaska, Senior Nurse, Territorial Department of Health
- Dorothy R. LeBlanc, R.N., 401 Third St., Westwego, La., Staff Nurse, New Orleans Health Department
- Ermyl M. Manni, 1033 Lilac Ct., N.E., Grand Rapids 3, Mich., Supervising Nurse, Ottawa County Health Dept.
- Pauline V. Mathis, R.N., Box 47, Olathe, Kan., Public Health Nurse, Johnson County Health Dept.
- Lottie M. Mathison, R.N., 508 N. Mason, Bloomington, Ill., Supervisor, McLean County Dept. of Health
- Emma M. Mattill, 312 Hickory, Santa Ana, Calif., Director of Nurses, Orange County Health Dept.
- Elizabeth H. McNeilly, R.N., A.B., 4164 Wilshire Blvd., Oakland 2, Calif., Deputy Director, Nursing Service, Pacific Area, American Red Cross
- Helen B. Meister, R.N., B.S., Board of Health, Burford Bldg., Arkansas City, Kan., Staff Nurse, Joint Board of Health
- Naomi G. Melloway, R.N., Hannibal-Marion County Health Dept., Hannibal, Mo., Public Health Nurse
- Edna I. Mewhinney, M.A., 213 Civil Courts Bldg., New Orleans, La., Generalized Nursing Consultant, State Health Dept.
- Jane Pendarvis, 1126 - 25th St., Des Moines, Iowa, Nurse, Public Health Nursing Assn.
- Gladys I. Reed, R.N., 608 No. B. St., Arkansas City, Kan., Public Health Nurse, Joint Board of Health
- Edna H. Richmond, Box 1607, Mabscott, W.

- Va., Public Health Nurse, Raleigh County Health Dept.
- Lola H. Robb, State Department of Health, Austin, Tex., Hospital Nursing Consultant
- Clara E. Rummenie, 1617 Spring St., Quincy, Ill., Supervisor, Nursing Division, Quincy Health Dept.
- Isabelle Ryer, R.N., B.S., 960 Gladstone, Apt. 401, Detroit 2, Mich., Supervisor, Field-Hospital Coördination Program, Dept. of Health and Herman Kiefer Hospital
- Bertha Sanders, R.N., 416 N. Fairview, Lansing, Mich., Supervising Nurse, Lansing Dept. of Health
- Bernice M. Senour, R.N., B.S., 715 S. 16th St., Terre Haute, Ind., Supervisory Nurse, State Board of Health
- Virginia D. Singleton, R.N., Betsey Barbour House, Rm. 320, Ann Arbor, Mich., Student, School of Public Health, Univ. of Michigan
- Jean South, M.A., 35-14 77th St., Jackson Heights, N. Y., Supervisor, Community Service Society
- Julia Stowell, R.N., Box 199, Hillsboro, Ore., Clinic Nurse, Washington County Health Dept.
- Mildred I. Terry, 53 Hamilton Terrace, New York 31, N. Y., Staff Nurse, Department of Health
- Irene Thompson, 7350 Lindell, University City 5, Mo., Deputy Director of Nursing, Mid-western Area, American Red Cross
- Jessie Turberg, R.N., 394 Second Ave., New York 10, N. Y., Acting Supervising Nurse, Department of Health
- Florence J. Ullman, R.N., P. O. Box 1097, Yuma, Ariz., Junior Asst. Nurse Officer, U. S. Public Health Nurse
- Marie Villing, 503 E. 3rd St., Cincinnati, Ohio, Supervisor of Public Health Nurses, City Health Dept.
- Jessie F. Waddell, R.N., B.S., 343 Wildewood, East Lansing, Mich., Chief, Bureau of Orthopedic Nursing, Michigan Crippled Children Commission
- New York 53, N. Y., Physician-in-Training, State Department of Health
- Michael L. Furcolow, M.D., M.A., University of Kansas Hospital, Kansas City, Kan., Surgeon, Tuberculosis Control Division
- Dr. Egberto Garcia, M.H.P., Padre Aguirre No. 117, Guayaquil, Ecuador, S. A., Jefe, Servicio Nacional de Fiebre Amarilla, Direccion General de Sanidad
- Sidney I. Goldberg, M.D., 68 East 86th St., New York 28, N. Y., Tuberculosis Clinician, Department of Health
- Lt. Comdr. John M. Hirst, Box No. 6, U. S. Naval Air Station, Banana River, Fla., Malaria, Pest Control and Sanitation Duties
- Eleanor Krasnov, 174 Grafton St., Brooklyn 12, N. Y., Student, New York University
- William A. Longshore, Jr., M.D., 8203 Cedar Rd., Elkins Park, Philadelphia 17, Pa., Physician-in-Training, New York State Dept. of Health
- B. E. Pickett, Sr., M.D., 106 Pena St., Carrizo Springs, Tex., formerly Health Officer, Dimmit County, Texas
- William C. Reeves, Ph.D., Hooper Foundation, San Francisco 22, Calif., Lecturer, School of Public Health, Univ. of California and Research Associate, Hooper Foundation
- Bichat de A. Rodrigues, M.D., Rua Barata Ribeiro 723, Copacabana, Rio de Janeiro, Brazil, S. A., Medico Sanitarista, Departamento Nacional de Saunde
- Carma F. Rohwedder, 708 Highview Ave., Glen Ellyn, Ill., Director, Central Registry, Venereal Disease Control Program, Chicago Health Dept.

#### *School Health Section*

- Harold W. Cook, M.A., 444 East 11th St., Upland, Calif., District Superintendent, Upland School District
- George M. Decherd, Jr., M.D., Health Service, Univ. of Texas, Austin, Tex., Director of Student Health Service
- Albert C. Delwarte, M.D., Ph.D., 118 E. Broadway, Tucson, Ariz., Private Practice
- Adeline S. Golkowski, R.N., B.S., 360 Taft St., Gary, Ind., School Nurse, Gary Public Schools
- Edna Graber, M.A., 1428 Harper Ave., Los Angeles, Calif., Student, Univ. of Michigan
- Gerald B. Harrigan, M.D., 215 Middle Neck Rd., Great Neck, N. Y., Chief Medical Inspector, Great Neck Public Schools
- Elizabeth B. Hinckley, M.D., 90 Morningside Drive, New York 27, N. Y., Chief of Pediatric Clinic, St. Luke's Hospital
- Charles V. Hogan, M.D., 317 W. Market St., Pottsville, Pa., Chief Medical Examiner, Pottsville School District

#### *Epidemiology Section*

- Paul J. Brandly, D.V.M., U. S. Department of Agriculture, Washington 25, D. C., Poultry Pathologist, Production and Marketing Administration
- John H. Brown, M.Sc., Dept. of Public Health, Adm. Bldg., Edmonton, Alta., Canada, Public Health Entomologist and Director, Division of Entomology
- Mohammed Farooq, M.B., D.P.H., D.T.M., Rockefeller Foundation, 49 W. 49th St., New York, N. Y., Deputy Director of Public Health, Hyderabad State, India
- Frank R. Freckleton, M.D., 2380 Grand Ave.,

Lawrence W. Holden, M.D., 945-12th St., Boulder, Colo., Director, Student Health Service, Univ. of Colorado  
 Amy B. Laybourn, 608 N. Emporia, El Dorado, Kan., Health Supervisor, El Dorado Public Schools  
 Timothy C. H. Liang, M.D., Newton Memorial Hospital, Cassadaga, N. Y., Resident Physician  
 Helen O. Merhige, 219 East 39th St., Brooklyn 3, N. Y., Student, New York University  
 Abraham Portman, M.D., 217 Washington St., Islington, Mass., School Physician, Westwood, Mass.  
 William A. Schmidt, M.D., 10 N. Jardin St., Shenandoah, Pa., Medical School Inspector, Shenandoah Public Schools  
 Melvin T. Woodhead, M.D., 146 Market St., Amsterdam, N. Y., Medical Supervisor, Public Schools

#### *Dental Health Section*

Harry W. Bruce, Jr., D.D.S., Chattanooga-Hamilton County Health Dept., Chattanooga, Tenn., Dental Officer  
 John E. Chrietzborg, D.D.S., M.P.H., State Department of Public Health, Springfield, Ill., Chief, Division of Public Health Dentistry  
 Evelyn Maas, D.H., 311 E. Chicago Ave., Chicago, Ill., Advisor to Dental Hygienists, Northwestern University Dental School  
 Harry B. Silver, D.D.S., 33 West 42nd St., New York 18, N. Y., Dentist, Stern Brothers  
 Nora K. Walter, D.H., 7760 Prairie Ave., Chicago 19, Ill., Educational Supervisor, Chicago Dental Society  
 Dr. Harry J. Watson, 473 Main St., Niagara, Wis., Dentist

#### *Unaffiliated*

David N. Bader, D.V.M., 12 Apollo St., Petersburg, Va., Veterinarian in Charge, Petersburg Animal Hospital  
 Leslie D. Beadle, M.A., 524 West Heron St., Denison, Tex., Senior Asst. Sanitarian (R), Communicable Disease Center, U. S. Public Health Service  
 Woodrow W. Benson, P. O. Box 846, West Lodge, Ypsilanti, Mich., Student, Univ. of Michigan  
 Jacob B. Berlin, 387 Hooker Ave., Poughkeepsie, N. Y., Student, Vassar College  
 Jose H. Colon-Morales, P. O. Box 1271, Mayaguez, P. R., Student in Sanitary Science  
 Urban D. Franklin, M.S., Rt. 2, Box 105, Birmingham, Ala., Principal Sanitarian, Alabama State Health Dept.

George W. Gillic, D.V.M., 1532 House Office Bldg., Washington, D. C., Member from Indiana, House of Representatives  
 Richard R. Griffith, Rayner Ave. and Dukeyland St., Baltimore 16, Md., Administrator, West Baltimore General Hospital  
 William H. Haskell, V.M.D., 707 Pere Marquette Bldg., New Orleans 12, La., Senior Milk Specialist, U. S. Public Health Service  
 H. Edwin Hilton, LL.B., 1615 H St., N.W., Washington, D. C., Secy., Health Advisory Council, Chamber of Commerce of United States  
 Lewis F. Hobbs, Jr., 417 S. Truitt, Salisbury, Md., Sanitarian, Bureau of Food and Drugs, State Department of Health  
 John Hunton, 450 Sutter St., San Francisco 8, Calif., Exec. Secy., California Medical Assn.  
 Harlem B. Ives, 12652 Livernois Ave., Detroit 4, Mich., Manager, Rose Exterminator Co.  
 Dale R. Lindsay, Ph.D., 218 W. Kelly, Pharr, Tex., S. A. Sanitarian (R) and Entomologist in Charge of Vector Control, U. S. Public Health Service  
 Dr. Julio E. Luigi, P. O. Box 147, Madrid and Basso, Rio Piedras, P. R., Medical Officer, Health Dept.  
 Barbara H. O'Callaghan, 232 N. Emerson, Portland 11, Ore., Social Worker, U. S. Veterans Hospital, Vancouver, Wash.  
 W. Phillips Palmer, 1433 Enfield Ct., Willow Run, Mich., Graduate Student, Univ. of Michigan  
 Eugene H. Payne, M.D., Box 118, R. P. Annex, Detroit, Mich., Clinical Investigator, (Tropical) Parke, Davis and Company  
 Ruth Rosenow, 204 Washington Apts., Lansing, Mich., Procedures Analyst, State Department of Health  
 Sara C. Stice, 620 So. 3rd St., Louisville 2, Ky., Personnel Officer, State Department of Health  
 Rhea Sylvester, 400 W. Hill Ave., Knoxville, Tenn., Chief Clerk, State Department of Public Health  
 Sidney R. Wallace, c/o R.C.N. Hospital, Halifax, N. S., Canada, Leading Sick Berth Attendant, Royal Canadian Navy  
 Justus C. Ward, M.S., 546 Custom House, Denver 2, Colo., Pharmacologist, Wildlife Research Laboratory, U. S. Fish and Wildlife Service  
 Ernest M. Yohn, Box 22, Fairhope, Ala., Senior Sanitarian, State Board of Health  
 Lt. Col. Edgar J. Young, 140 Grosvenor Ave., Ottawa, Ont., Canada, Asst. Director of Medical Services, Canadian Army

SEVENTY-FIFTH ANNUAL MEETING  
AMERICAN PUBLIC HEALTH ASSOCIATION  
ATLANTIC CITY, N. J., OCTOBER 6-10, 1947

HOTEL RATES, ATLANTIC CITY, N. J.

BOARDWALK HOTELS

Hotels		Total Rooms	Rooms with Bath	
			Single	Double
AMBASSADOR	Brighton Ave.	670	\$6.00-\$9.00	\$9.00- \$14.00
APOLLO	New York Ave.	51		8.00- 12.00
BREAKERS	New Jersey Ave.	475	4.00- 7.00	5.00- 12.00
BRIGHTON	Indiana Ave.	291	7.00-	9.00- 14.00
CHALFONTE-HADDON HALL	North Carolina Ave.	1,000	6.00-10.00	8.00- 18.00
CHELSEA	Morris Ave.	400	5.25- 6.75	6.75- 15.00
CLARIDGE	Park Pl.	406	6.00-14.00	9.00- 17.00
DENNIS	Michigan Ave.	475	6.00- 8.00	9.00- 14.00
MARLBOROUGH-BLENHEIM	Park Pl.	464	6.00-10.00	9.00- 16.00
MAYFLOWER	Tennessee Ave.	280	5.00- 6.00	7.00- 12.00
NEW BELMONT	S. Carolina Ave.	100	5.00- 6.00	7.00- 12.00
PRESIDENT	Albany Ave.	500	7.00-10.00	9.00- 15.00
RITZ-CARLTON	Iowa Ave.	431	6.00- 8.00	9.00- 14.00
ST. CHARLES	St. Charles Pl.	300	5.00-12.00	7.00- 14.00
SEASIDE	Pennsylvania Ave.	235	5.00-11.00	8.00- 14.00
SHELBURNE	Michigan Ave.	300	6.00- 9.00	9.00- 12.00
STRAND	Pennsylvania Ave.	271	4.50- 6.00	9.00- 12.00
TRAYMORE	Illinois Ave.	600	6.00-14.00	9.00- 18.00

AVENUE HOTELS

Hotels		Total Rooms	Rooms with Bath	
			Single	Double
BOSCOBEL	Kentucky Ave.	120		\$8.00
CLARENDON	Virginia Ave.			7.00
COLTON MANOR	Pennsylvania Ave.	208	\$5.00-\$9.00	8.00-\$12.00
COLUMBUS	Pacific Ave. at St. James	100		6.00
CRILLON ★	Pacific Ave. at Indiana	49		8.00- 10.00
EASTBOURNE	Pacific Ave. at Park	75		7.50- 8.00
FLANDERS	St. James Pl.	125	5.00	7.00- 9.00
FOX MANOR	Pacific Ave. at Belmont	60		8.00- 10.00
HOLMHURST	Pennsylvania Ave.	100		7.00- 8.00
JEFFERSON	Kentucky Ave.	150	6.00	7.00- 10.00
KENTUCKY	Kentucky Ave.	110	3.50	6.00- 7.00
LAFAYETTE	N. Carolina Ave.	100	5.00- 6.00	8.00- 10.00
MADISON	Illinois Ave.	210	4.50- 6.00	7.00- 10.00
MONTICELLO	Kentucky Ave.	175		7.00
MORTON	Virginia Ave.	300	5.00- 6.00	7.00- 9.00
PENN-ATLANTIC	S. Carolina Ave.	125		7.00
RUNNYMEDE	Park Pl.	75	4.00- 7.50	6.00- 10.00
SENATOR	S. Carolina Ave.	260	4.50- 7.00	7.00- 12.00
STERLING	Kentucky Ave.	83	4.00- 5.00	6.00- 7.00
VILLA D'ESTE	Pacific Ave. at Chelsea	40		8.00- 14.00

★ Rate Includes Breakfast

Institutions Accredited by the American Public Health Association to Give the Degree of Master of Public Health (Diploma of Public Health in Canada) and the Degree of Doctor of Public Health for the Academic Year 1947-1948

This list is released by the Executive Board of the American Public Health Association as of March 3, 1947, and includes those institutions from which requests for accreditation had been received to that date. Additional applications will be acted upon in due course.

The following schools are accredited on the basis of the criteria governing accreditation for the academic year 1946-1947.

For the M.P.H. Degree

- University of California School of Public Health
- Columbia University School of Public Health
- Harvard University School of Public Health
- The Johns Hopkins University School of Hygiene and Public Health
- University of Michigan School of Public Health

- University of Minnesota School of Public Health
- University of North Carolina School of Public Health
- University of Toronto School of Hygiene
- Vanderbilt University School of Medicine
- Yale University School of Medicine, Department of Public Health

For the Dr.P.H. Degree

- University of California School of Public Health
- Columbia University School of Public Health
- Harvard University School of Public Health
- The Johns Hopkins University School of Hygiene and Public Health
- University of Michigan School of Public Health
- University of North Carolina School of Public Health
- Yale University School of Medicine, Department of Public Health

APPLICATION FOR HOTEL ACCOMMODATIONS

American Public Health Association, October 6-10, 1947

NOTE: Single rooms are very limited in number. Please arrange to occupy twin-bedded rooms.  
HOUSING BUREAU, 16 Central Pier, Atlantic City, N. J.

Please reserve the following:

Hotel .....	First Choice	Hotel .....	Fourth Choice
Hotel .....	Second Choice	Hotel .....	Fifth Choice
Hotel .....	Third Choice	Hotel .....	Sixth Choice

..... Room(s) with bath for ..... person(s). Rate \$..... to \$..... per room.

Arriving Atlantic City ....., hour ..... A.M. Leaving ..... P.M.

NOTE: You will receive confirmation direct from the hotel accepting the reservation when made.

Rooms will be occupied by:

Name	Street Address	City	State
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....

ASSOCIATION TO BE REPRESENTED AT  
MEETING OF ROYAL SANITARY  
INSTITUTE

President Harry S. Mustard, M.D., President-Elect Martha M. Eliot, M.D., and Thomas Dublin, M.D., have been designated as representatives of the Association at the meeting of the Royal Sanitary Institute in Torquay, England, during the week of July 7.

DR. UPDYKE ON STAFF

On March 1 Elaine Updyke, Ph.D., joined the Staff of the Association to work with Pearl Kendrick, M.D., on the pertussis study being conducted under the auspices of the Subcommittee on the Evaluation of Administrative Practices. Dr. Kendrick's pertussis work is being carried on in the Grand Rapids Laboratories of the Michigan State Department of Health, where she is Associate Director of Laboratories in charge of the Western Michigan Division.

A MESSAGE FROM THE CIRCULATION  
DEPARTMENT

Because public health workers are notoriously frequent movers hundreds of changes of address are reported to the Circulation Department each month. These changes are recorded promptly. Occasionally, however, a member will write in complaining about non-receipt of *Journals* and report for the first time a new address which has been in effect for several months.

New address notifications received before the 15th of the month will catch the next issue of the *Journal*. Those received between the 15th and the end of the month will be made with the *Journal* published the month after the next. It will assist the Circulation Department and benefit the individual

member if address changes are reported to the Association a month in advance.

Members are also urged to notify their post offices of their new address when they move and to instruct that mail be forwarded.

CLOSING DATE FOR SUBMISSION OF  
FELLOWSHIP APPLICATIONS

August 1 will be the last date on which Fellowship applications can be accepted for consideration at the 1947 Annual Meeting in Atlantic City. Eligible members who wish to apply for Fellowship this year are therefore urged to send in their applications as early as possible.

DR. HOWARD M. KLINE OF A.P.H.A.  
STAFF ON LEAVE

Howard M. Kline, Ph.D., Bethesda, Md., Technical Secretary of the Subcommittee on Medical Care, American Public Health Association, has been loaned until July 1, 1947, to the President's Scientific Research Board of Washington at the request of the Executive Office of the President. This Board was created by Executive Order in October, 1946, for the purpose of inventorying all research activities in the United States and with special reference to the research which is being conducted within the federal establishment and that which is being conducted outside the federal establishment with federal funds.

Dr. Kline will direct the survey of medical research and conduct special studies incident thereto.

During his leave of absence the staff of the Subcommittee on Medical Care is being guided by Milton Terris, M.D., M.P.H., Medical Associate of the Subcommittee, under the direction of Joseph W. Mountin, M.D., *Chairman*.

## EMPLOYMENT SERVICE

The following pages present information for those seeking qualified public health personnel and for those seeking positions in public health.

This is a service of the Association conducted without expense to the employer or employee.

Address all correspondence to the Employment Service, A.P.H.A., 1790 Broadway, New York 19, N. Y., unless otherwise specified.

### POSITIONS AVAILABLE

(Supplemental to list in April Journal)

**Wanted: Health Coordinator**, to work under social welfare council with boards of health, community agencies and schools in 5 neighboring suburban communities; commuting district of metropolitan New York. Total population 186,000. Training and experience in health education and community organization desired. Write Box E-1, Employment Service, A.P.H.A.

**Wanted: Well-qualified full-time health officer** to organize new midwestern city-county health department. Maximum starting salary \$8,000, depending on training and experience. Excellent community interest and support. Write Box H-1, Employment Service, A.P.H.A.

**Wanted: Bacteriologist** in state branch laboratory, New York State. Required: college degree with specialization in bacteriology and three years' pertinent experience; or 1 year graduate study and 1 year experience. Civil Service, no residence requirement. Beginning salary \$2,400, advancement possible. To work under moderate supervision. Write Box J-1, Employment Service, A.P.H.A.

**Wanted in Northwestern State Health Department:** (1) Epidemiologist and Deputy State Health Officer; (2) Director of the Division of Maternal and Child Health; (3) Director of the Division of Tuberculosis Control. Salary \$5,400 to \$6,600 depending on training and experience. Write Box M-1, Employment Service, A.P.H.A.

**Wanted: Physician** for full-time industrial position in established company, Eastern Pennsylvania. Candidates must be graduates of recognized medical school, preferably with previous industrial and surgical training and/or experience. Should be desirous of entering the industrial field on a permanent basis. Preference for men under 35. Starting salary approximately \$7,500 annually. Write Box K-1, Employment Service, A.P.H.A.

**Wanted: Sanitary Engineer and Sanitarians** for Division of Public Health

Engineering in southern Health Department. Entrance salary contingent on experience and previous earnings. Engineering duties consisting of water, sewage, food, milk, and general sanitation. Some construction and design experience preferred. Engineer to serve as assistant to chief of division. One sanitarian to serve in technical capacity on milk sanitation. Knowledge and experience in both field and laboratory necessary. Another sanitarian to serve in the capacity of rodent control supervisor. It is preferred that this individual have training and experience by the U. S. Public Health Service or the equivalent thereof. It is necessary that the engineer and milk sanitarian hold a degree in their respective fields, or several years experience in addition to 2 years of formal academic training. Write Box U-3, Employment Service, A.P.H.A.

**Wanted: Public Health Staff Nurses** for well established health department in California. Generalized service in urban and rural areas to approximately 200,000 people. Starting salary \$2,640 annually with adjustments based on experience. Retirement provided. Cars furnished. Applicants must be eligible for nurse registration in California. Headquarters 80 miles from San Francisco. Write Box R-1, Employment Service, A.P.H.A.

**Wanted: Education Supervisor** for Visiting Nurse Association in city 15 miles from New York. Agency receives affiliating university students for 3 months field work in public health nursing during early part of 2 semesters annually. Write Box P-1, Employment Service, A.P.H.A.

**Wanted: Sanitarian** for Metropolitan County Health Department in area of Detroit, Mich. for general sanitation program. Must furnish own transportation. Salary \$3,090 to \$3,570. Mileage at 7¢ per mile. Retirement plan. Apply Wayne County Health Department, Eloise, Mich.

**Wanted: Public Health Nurses** for generalized nursing program. Salary range \$2,200 to \$2,800 per year, depending upon experience and education. Must have own car. Mileage allowance up to \$700 per year. Forty-two hour week. Full-time county health department with supervising nurse. Population 60,000, 60 per cent rural. Attractive resort area. Excellent opportunity to study nutritional problems in conjunction with U. S. Public Health Service nutrition survey here. Apply Director, Ottawa County Health Department, Grand Haven, Mich.

**Wanted: Director of the Sanitation Division, St. Louis County Health Department.** Required: graduation with an engineering degree from an accredited school; master's degree in sanitary engineering, public health, or equivalent from an accredited school; at least 4 years experience within the past 8 years in the field of public health engineering, 2 of which must have been in a responsible supervisory capacity. Salary \$3,600 to \$4,200 a year, plus travel. Write Health Commissioner, St. Louis County Health Department, P.O. Box 267, Clayton 5, Mo.

**Wanted: Health Officers** with experience or training in public health for county health units as follows: Columbia-Hamilton-Gilchrist Counties, Lake City; Gadsden-Liberty-Calhoun Counties, Quincy. Also, Medical Director for Bureau of Maternal and Child Health, with headquarters in Jacksonville. Salaries dependent upon training and experience. Liberal mileage allowances. Write State Health Officer, P.O. Box, 210, Jacksonville, Fla.

**Wanted: Associate Bacteriologists** thoroughly experienced in clinical methods to take charge of state-wide clinical laboratory program. Central Laboratory, Baltimore, Md.

**Two Associate Bacteriologists** for general medical-public health laboratory work in branch laboratories.

**Assistant Bacteriologist** for general medical-public health work for branch laboratory at Cumberland, Md.

All positions under State Merit System. Make application to Dr. C. A. Perry, 2411 N. Charles Street, Baltimore 18, Md.

**Wanted: Physician** for position of Assistant Chief, Division of Child Hygiene, Ohio Department of Health. Salary \$5,500-\$6,000. Must be graduate of approved medical school, have 1 year's internship and at least 1 year of graduate training, plus 1 year of training or experience in clinical pediatrics. Experience in maternal and child health

desirable. Must be licensed in Ohio or eligible for licensure. Apply Chief of Division of Child Hygiene, Department of Health, State Departments Building, Columbus 15, Ohio.

**Wanted: Occupational Therapist** for half time at Potts Memorial Institute and half time at Columbia Sanatorium, both in Columbia County. Salary \$2,400. Please apply to Dr. H. A. Pattison, Director, Potts Memorial Institute, Livingston, N. Y.

**Wanted: Senior Nurse,** to take charge of nursing staff of five; small city-county health department, Ohio. Headquarters 20 miles north of Columbus; college town. Requirements: certificate in public health or one year public health training in approved school plus two years' public health experience. Salary \$2,420 plus mileage paid by Ohio State Health Department. Civil Service. Write Alexander Witkow, Health Commissioner, Delaware Health Department, Delaware, Ohio.

**Wanted: Public Health Staff Nurse** in planned teaching center. Public Health Certificate desirable. Generalized program. Supervision. Opportunity for advanced education in Public Health. Salary depends on qualification. Write to Dr. F. M. Teeple, M.D., M.P.H., Health Commissioner, or Mrs. Esther B. Bartlett, R.N., B.S., Director of Nurses, Wood County Bowling Green General Health District, Bowling Green, Ohio.

**Wanted: Bacteriologist,** male, with Master's degree and minimum of two years' experience in public health bacteriology. Good opportunity for merited advancement. Apply to Georgia Department of Public Health, Atlanta 3, Ga.

**Wanted: County Public Health Physicians.** Several positions for qualified public health physicians in Oregon counties. Salary \$6,600 to \$7,800; ample travel and expense allowances; qualifications—graduation from an approved school of medicine; internship; eligibility for medical licensure. Positions under Merit System. Apply to: Mr. A. T. Johnson, Merit System Supervisor, 1022 S.W. 11th Ave., Portland 5, Ore.

**Wanted: Health Officers** in the Florida State Board of Health. Will need six Health Officers for positions as directors of County and District Health Departments, beginning July 1, 1947. Salaries will run from \$5,700 to \$6,300 per annum, depending on training and experience. Necessary mileage in addition at 7½¢ per mile. The State has a Merit System and



Retirement System for Security. Address Wilson T. Sowder, M.D., State Health Officer, Box 210, Jacksonville, Fla.

**Wanted:** Nurses for central California full-time health unit: 1 supervising public health nurse with degree in public health and 3 staff nurses with certificates in public health. Salaries open. Direct inquiries to Dr. C. S. Ambrose, Box 110, Visalia, Calif.

**Wanted:** Educational Supervisor, experienced, with degree in Public Health Nursing. Staff of 11 nurses; student program; 40 hour week; salary open. Apply: Visiting Nurse Association, Evanston, Ill.

**Positions available:** (1) Public health nursing supervisor, (2) staff nurses for Allegan County Health Department, resort center of Southwestern Michigan. Personnel policies offer: 40 hour, five day week; one month vacation; sick leave; liberal salaries and car maintenance allowance. Attractive rural county of 43,000 population situated on Lake Michigan, less than 150 miles from Detroit and Chicago. Health department established 16 years, budget over \$48,000, capable clerical staff, student training program; new director was recently appointed. Generalized challenging and stimulating program. Write, Arthur G. Baker, M.D., Director, Allegan County Health Department, Allegan, Mich.

**Wanted:** Supervisor for staff of eight nurses in health department conducting school health demonstration and generalized program. State qualifications in application. Minimum salary \$2,280 and travel allowance. Write Director Joint Health Department, 106½ E. 9th St., Winfield, Kan.

**Wanted:** Public health nurses for generalized nursing program. Salary range \$225-\$255 per month. Under civil service, 40 hour week, vacation and sick leave privileges. Cars furnished. Write Director of Public Health Nursing, City of Seattle, 504 County-City Building, Seattle 4, Wash.

**Wanted:** Medical Social Workers by State Agency rendering eye medical care to those unable to pay for these services; as well as rehabilitation and physical restoration services. Position requires worker with educational background of R.N. and public health training, who has had experience in the field of medical social case work or with private social agencies. Ability to plan for executing work efficiently is a necessity. Write Box T-1, Employment Service, A.P.H.A.

**Wanted:** Director of County Health Work in West Virginia State Department of Health, Charleston. Salary \$6,000 plus travel. Position under state merit system. Qualifications: M.D. with three years' full-time experience in the field of public health. Must be eligible for West Virginia license. Write Dr. N. H. Dyer, State Health Commissioner, State Department of Health, Charleston 5, W. Va.

**Wanted:** The Tennessee Valley Authority announces openings in its Health and Safety Department for well qualified physicians. Training and experience in public health and employee medical services are desirable. The entrance salary is \$4,950 per annum, based on a 40 hour week schedule with provision for within grade increases to \$5,900. Retirement, annual, and sick leave benefits are provided. Interested candidates should write the Tennessee Valley Authority, Personnel Department, Knoxville, Tenn.

**Wanted:** School Nurse for private school in Hawaii. To live on campus. Responsibilities: general school health and health of approximately 100 boarding school students. Three months' summer vacation, 2 and 1 week respectively during school year. Write Box V-1, Employment Service, A.P.H.A.

**Wanted:** Health Educator to work in close connection with a city health department in Virginia. Man or woman with M.P.H. degree, able to conduct a demonstration program of community coordination and education. Salary \$3,300 plus car allowance. Write Box W-1, Employment Service, A.P.H.A.

#### POSITIONS WANTED

**Position as Director of Food Sanitation.** Well versed in Public Health control of food products, food, milk, and meat products. Graduate dairy technology, 12 years' practical experience dairy farming, operation of milk, butter, and ice cream plants, 21 years' public health enforcement of sanitary require-

ments pertaining to producer-dairy and pasteurization plants, food handling establishments and meat slaughtering, and processing. Past four years as director. Organizing and stabilizing food control program for large city. Age 47. State full particulars. Good references. Write Box L-529, Employment Service, A.P.H.A.

**Physician**, five years' experience as director of public school health system, four years in army, will receive M.P.H. from accredited midwestern university in June, 1947, seeks student health or child hygiene appointment, Southwest preferred. Write Box Q-1, Employment Service, A.P.H.A.

**Health Education Consultant**—Available on a temporary or contract basis for organization and development of projects in the field of public relations. Write Box H-532, Employment Service, A.P.H.A.

**Health Education**. Community Organization. Woman, M.S., A.B., R.N., experienced in community and college teaching, community organization, preparation of health education material and group work desires responsible position. Experience includes work on local, state, and national level. Write Box H-534, Employment Service, A.P.H.A.

**Laboratory investigative** and/or routine work, special interest in diseases transmissible from animals to men. B.S., D.V.M., 8 months' veterinary, some laboratory and research experience. Male, 24 years old. No geographic preference. Write Box L-525, Employment Service, A.P.H.A.

**Milk specialist** (plant, field or laboratory) interested in all phases of milk and food control, environmental sanitation, teaching. Degrees: D.V.M., M.S. (bacteriology and public health). Experience: administrative (acting director of meat and milk department, large city health department); food and drug inspector; research; private veterinary practice; live stock business. Publications mainly on brucellosis. Write Box L-527, Employment Service, A.P.H.A.

**Editorial or research position**. Broad experience in abstracting, translating. Four years as writer in state mental hygiene agency. Interested in preventive medicine, health education, mental hy-

giene, and general medical problems. Prefer East or West Coast. Write Box M-500, Employment Service, A.P.H.A.

**Sanitary Engineer**, M.S. (Sanitary Engineering), age 30, available July 1, for domestic position. Two years' experience includes sanitation director of a Michigan county health department plus training public health personnel. Veteran with overseas experience on public water supplies and sewage disposal for army camps and large European cities. Write Box M-507, Employment Service, A.P.H.A.

**Bacteriologist - Parasitologist**, M.D., M.S., C.P.H., 2 years research, 7 years teaching, 7 years public health work, numerous publications chiefly on intestinal microorganisms, is seeking responsible position in research, public health laboratory or teaching. Write Box L-518, Employment Service, A.P.H.A.

**Bacteriologist**, B.S. Experience: State Health Dept. 5 years, recent laboratory officer and instructor in bacteriology, Sanitary Corps, A.U.S. 2½ years. Write Box L-520, Employment Service, A.P.H.A.

**Veterinarian** chiefly interested in food control (D.V.M. 1940, M.P.H. expected June 1947); seeks position in field of food and drug administration or in food industry (laboratory or advisory). Experience: 2 years' animal disease control work (U. S. Dept. of Agriculture), 1 year meat inspection (Government), 4 years' food control and sanitation (U. S. Army Veterinary Corps). Write Box V-300, Employment Service, A.P.H.A.

**Veterinarian** with six years' experience in food and dairy inspection desires position as milk sanitarian or veterinarian in public health. Education includes three years' academic college work prior to professional training. Employed at present with local health department. Present salary \$3,500. Write Box V-302, Employment Service, A.P.H.A.

### Advertisement

## Opportunities Available

**WANTED**—(a) Director of communicable disease division; duties include administration of communicable disease control, examination of school children, immunization, infant and child welfare clinics; fairly large city in Ohio. (b) Physician with extensive experience in medical society work to serve as executive officer of state medical society; East. (c) Young physician for position of director of health and physical education; public school department of

health; staff of 12 nurses, 2 dentists and approximately 40 physical education instructors; enrollment of 16,000 students; faculty of 6,000; town of 75,000 located short distances from several large cities including university medical center. (d) Student health physician; coeducational college; well equipped 100 bed hospital; town of 18,000 located short distances from several large cities; \$4,500 plus opportunity of private practice; Southwest. (e) Well trained and

experienced public health officer to join staff of city health department; Pacific Coast; \$7,200. (f) Medical director; health service of national organization; administrative experience required; would be assigned responsibility of health service for organization in seven of southeastern cities; \$6,000-\$7,800. (g) Young man and, also, young woman physician for student health appointments with coeducational college; town of 10,000; positions carry rank of assistant professor; 10 month year; West. **PH5-1** Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago 11.

**WANTED**—(a) Health educator; department of bacteriology and public health, liberal arts college; young man with Doctor of Public Health or Ph.D. degree required; duties include teaching hygiene and public health, training of sanitarians and supervision of sanitary conditions on the campus; West. (b) Biological, sanitary, or chemical engineer interested in biological problems; experience in pilot plant operation desirable; advantageous if experienced also in manufacturing of antibiotics; should be interested in biology and apparatus in which biological things are processed; administrative ability necessary; university appointment; Middle West. (c) Health educator to conduct community education program, tuberculosis association; Rocky Mountain area; \$3,000. (d) Health educator; county tuberculosis association; thorough knowledge of tuberculosis required; town of 100,000, Middle West. (e) Health educator (man) to take charge of state-wide program, division of one of the national organizations; South; \$4,000 including travel expenses. (f) Bacteriologist; public health appointment; duties administrative including consider-

able research; \$3,800; New England. **PH5-2** Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago 11.

**WANTED**—Nutritionist to supervise division of bureau of maternal and child health; preferably someone with year's graduate study in nutrition and four years' experience or equivalency; \$3,600-\$4,300 plus traveling expenses. **PH5-3** Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago 11.

**WANTED**—(a) Education supervisor and two staff nurses; visiting nurse association, residential town near Chicago. (b) Public health nurses with fluent knowledge of Spanish to undertake public health work in Argentina for period of 12-18 months. (c) School nurse; small college, Alaska. (d) Student health nurse; duties consist of taking charge of college hospital; staff of ten nurses, six physicians; enrollment of 8,000 students; East; \$2,500-\$3,000, maintenance. (e) Public health nurse qualified in orthopedics, small town, East; car provided. (f) Student health nurse; young women's college, enrollment of 700 students, well equipped infirmary; six weeks paid vacation annually; Pacific Coast. (g) Director; municipal public health department; generalized program covering area of 65,000; New England. (h) School nurse; large private school conducted under American auspices in large city of United States dependency; duties principally with boarding department which averages hundred boys and girls; salary dependent upon qualifications; beautiful campus. **PH5-4** Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago 11.

### Advertisement

## Opportunities Wanted

Young man experienced in industrial hygiene and toxicology; Ph.D. degree; several years, instructor of industrial hygiene and bacteriology, graduate school of Eastern university; during war served as health consultant; past year, industrial hygienist of large industrial company; for further information, please write Burneice Larson, Director, The Medical Bureau, Palmolive Building, Chicago 11.

Public health physician is available; B.S., M.D., Southern school; M.P.H., school of hygiene and public health, Johns Hopkins; two years' public health experience; several years, director of industrial hygiene department of large industrial company; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Young dentist is available for appointment; A.B., D.D.S. degrees middle western university; several years' teaching in liberal arts college before entering school of dentistry; considerable administrative experience; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Health educator; A.B., several years' experience in teaching sciences before taking graduate training in

health education; M.S., P.H., middle western university; eight years, director of health education, municipal and county tuberculosis association; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Sanitary chemist; for past eight years has been doing research and some field work with stream pollution investigations; work has been concerned principally with wastes from synthetic rubber plants, food dehydration plants, etc.; in addition has had several years of industrial experience which included research and control work in the fields of explosives and alkalies; B.S. and M.S. degrees; has completed course work but not thesis for Ph.D. degree; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Nutritionist; B.S. in home economics, M.S. in nutrition; year's fellowship in nutrition during which time she completed vitamin assay of foods; several years on faculty of department of nutrition of university school of home economics; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

## NEWS FROM THE FIELD

### NATIONAL HEALTH COUNCIL RESOLUTION FOR LOCAL HEALTH UNITS

The annual meeting of the National Health Council held in New York City on March 21 adopted the following resolution endorsing the general aim of local health units:

Because coverage of every community of our Nation by the services of an efficient and economical local health department is essential for further development and protection of the health of our people through voluntary as well as official agencies, be it

RESOLVED by the Delegates of the National Health Council that early extension of local health departments with full-time professionally qualified health officers and appropriate associate personnel adequate to the need of all our population be a major concern of the Council; and be it further

RESOLVED that the member agencies of the National Health Council be urged to encourage their state and local organizations to discover the extent of present inadequacy of local health services and take an active part in efforts to secure local health units suitable for each jurisdiction of local government.

Dr. Haven Emerson, Chairman of the Subcommittee on Local Health Units of the American Public Health Association, was the principal speaker at the luncheon meeting. He challenged his audience to action on the basic deficiency in the national health program, which, if uncorrected, would make impossible the fullest realization of the separate goals of the member agencies. He reminded them of the fact that one-third of the population of the United States is without full-time local health service, that the average per capita expenditure for such service is only 61 cents, although one dollar is considered necessary for even minimum service, and that the chief obstacle in overcom-

ing current deficiencies in service is the unsuitability of the 155,000 units of local government for providing health protective services. He urged the Council members to become active in reducing current health jurisdictions to about 1,200 county or multi-county health districts. Through these, the special cancer, tuberculosis, social hygiene, and other programs may be made really effective. Without such a basic tax-supported public health structure many current activities of specialized voluntary agencies are wasteful and ineffective.

### MASSACHUSETTS HAS NEW BLOOD PROCESSING LABORATORY

On March 26 the Massachusetts State Department of Health dedicated a new Blood Processing Laboratory at Forest Hills. Geoffrey Edsall, M.D., is Director of the Division of Biologic Laboratories.

### THE ARMY FORMS A VENEREAL DISEASE CONTROL COUNCIL

The March, 1947, issue of *The Bulletin* of the U. S. Army Medical Department carries news that should be of interest to everyone concerned with the control of venereal disease. The War Department, as a result of its experiences during the war, recognized the fact that venereal diseases could not be controlled entirely through the efforts of the surgeon of a command.

According to the report carried in the above mentioned bulletin, the Army is preparing to meet with this deficiency through the formation of the War Department Venereal Disease Control Council, which will consist of the Director of Personnel Administration, Chief of the Chaplains, Chief of Special Services, Provost Marshal General, Sur-

geon General, Chief of the Bureau of Public Relations, and representatives of the Secretaries of War, the Army Air Forces, and the Army Ground Forces.

According to the article, the duties of the Council will be quite widespread going into the multitudinous problems involved in the control of venereal disease. The assistance of other official and nonofficial agencies is to be sought.

#### NURSE RECRUITMENT PROGRAM

The American Hospital Association (18 E. Division St., Chicago 10) has initiated and is sponsoring a national Student Nurse Recruitment Program. Its goal is at least 45,000 student nurses in the nation's 1,300 nursing schools in 1947. This is 50 per cent more student nurses than were registered in 1946.

The Hospital Association has appropriated \$10,000 toward financing the program. The Advertising Council, Inc., is also giving active assistance as well as are organizations and associations interested in the nurse shortage. A special staff has been assembled at the Hospital Association headquarters to assist and stimulate development of local Student Nurse Recruitment programs.

A survey by the American Hospital Association showed that on February 15, more than 33,000 hospital beds throughout the country were closed, chiefly because of the shortage of nurses. Further, more hospitals report growing waiting lists for admissions for care of non-emergency conditions.

#### MINNESOTA PUBLIC HEALTH CONFERENCE ORGANIZED

In January, the Minnesota Public Health Conference was organized by a group of persons professionally interested in public health. Active membership is made up of those persons engaged in public health work in Minnesota who are members or Fellows of

the American Public Health Association, or eligible to such membership. Provision is also made for corporate membership, and three classes of non-voting membership—associate, honorary, and sustaining. Future affiliation with the American Public Health Association is planned.

The new organization is an outgrowth of the 40 year old Minnesota State Sanitary Conference which has been relatively inactive in recent years.

The officers of the new Conference are:

*President:* Floyd Feldman, M.D., Health Officer, Rochester

*Vice-Presidents:* A. E. Amundsen, M.D., Health Officer, Little Falls; J. Lawrence McLeod, M.D., Health Officer, Grand Rapids

*Treasurer:* Charles G. Sheppard, M.D., Health Officer, Hutchinson

*Secretary:* Donald A. Dukelow, M.D., Secretary, Health Division, Minneapolis Council of Social Agencies

#### INDIANA PUBLIC HEALTH ASSOCIATION

Late in 1946 a group of Indiana public health workers met to organize the Indiana Public Health Association. It is planned that it shall be eligible for affiliation with the American Public Health Association. The first annual meeting will be held at some time in the spring of 1947.

Officers of the new Association are:

*President:* Murray A. Auerbach, Executive Secretary, Indiana Tuberculosis Association

*Vice-President:* Walter L. Portteus, M.D., President, Indiana Health Officers' Association

*Secretary:* Lucretia Saunders, Health Education Consultant, Indiana State Department of Health

*Treasurer:* Cecelia Schuck, Ph.D., Director of Nutrition, Purdue University

#### SOCIAL ASPECTS OF ATOMIC BOMB AWARD

The Society for the Psychological Study of Social Issues of the American Psychological Association announces an award of a \$1,000 United States Government Bond to encourage research

on the social aspects of the atomic bomb. Known as the Edward L. Bernays Atomic Energy Award, it will be given in 1947 to the individual or group contributing the best action-related research in the field of the social implications of atomic energy. The committee of judges includes six university professors whose chairman is Dr. David Krech, Swarthmore College, Swarthmore, Pennsylvania. All communications should be addressed to him and all entries must be in his hands, in duplicate, not later than November 1, 1947.

#### NORTH CAROLINA MEDICAL CARE COMMISSION

The *Charlotte* (N. C.) *News* for February 11, 1947 is a 52 page issue whose title page reads "Better Health for North Carolinians: A factual survey of state health needs." This has articles by many public health experts, among them State Health Officer Carl V. Reynolds, M.D.; Medical Care Commission Executive Secretary, John A. Ferrell, M.D., and other members; I. G. Green, M.D., President of the Good Health Association; Selz C. Mayo, Rural Sociologist of the North Carolina State College, and many others. Included also is the five-year hospital plan of the Medical Care Commission by which North Carolina's 20,000 present hospital beds would be increased by about one-half.

Among other material prepared by or describing the work of the North Carolina Medical Care Commission is a booklet of endorsements of the Commission's health plan. Copies have also been received of the health bills being considered by the North Carolina legislature. These bills provide that the Commission shall allocate state funds to local governments for the construction and maintenance of hospitals, license public and voluntary hospitals, and administer a loan fund for medical, dental,

nursing, or pharmacy students who will practise in a rural area of the state for 4 years after being licensed.

Also received from the Commission is a pamphlet of its public relations branch, the North Carolina Good Health Association. This is entitled "North Carolina's No. 1 Need: Good Health." It lists 14 unfavorable health situations in the state such as its high infant and maternal mortality rates, its shortage both of practising physicians and of hospital beds, its high percentage of draft rejections, and high percentage of "repeaters" in school grades. Then are listed the things to be done, the Commission's plan for accomplishing these things, what they will cost and what their benefits will be.

The Medical Care Commission has also published *Hospital and Medical Care for all our People*, which is a republication of the various subcommittee reports of the Governor's Hospital and Medical Care Commission created in 1944 and operating until the permanent Medical Care Commission was created late in 1945. All data of these reports have been revised as of February, 1947. State Health Commissioner Reynolds has said that these committee reports are "the most comprehensive, accurate, and informing review of health conditions ever made in the history of North Carolina—and probably the best ever yet made for any Southern State."

#### PRESIDENT URGES U. S. PARTICIPATION IN WORLD HEALTH ORGANIZATION

On March 21 President Truman sent to the United States Congress, a proposed joint resolution urging participation in the World Health Organization. He strongly recommended early consideration, pointing out that the United States signature to the constitution in July, 1946, was contingent on Congressional endorsement.

The World Health Organization becomes a permanent body upon legisla-

tive endorsement by 26 states. Currently, eight countries have ratified the proposed constitution adopted by the World Health Conference of 1946, the latest to ratify being the government of Switzerland.

Last November the WHO took over from the UNRRA the functions of the International Sanitary Conventions on collection and dissemination of information on pestilential diseases. This year all other UNRRA health functions have been turned over, together with a fund of one and a half million dollars. These include a malaria control program in Europe; a tuberculosis program, which includes mobile x-ray units for case finding; training fellowships for health technicians; "the Ethiopian project," for training health leaders in Ethiopia in disease control; and a program of aiding government by missions of public health experts.

#### U.S.S.R. APPOINTS MINISTER OF HEALTH FOR SOVIET UNION

Colonel General Yefim Ivanovitch Smirnov, D.M.Sc., who was formerly Chief of the Medical Division of the Ministry of Defense and Professor in Leningrad of Military Medicine, age 45, has been appointed Minister of Health of the Soviet Union. According to reports, this is the first time this post has been held by a person wholly the product of the Soviet system. His appointment replaced Dr. Mitervec as Minister of Health on February 17.

#### U. S. SENATE HEARINGS ON PROPOSED CABINET STATUS FOR PUBLIC HEALTH

Hearings in Washington before the Senate Committee on Expenditures in the Executive Departments, Hon. George B. Aiken of Vermont, Chairman, began on March 17 with special reference to the Taft-Fulbright Bill (S. 140) and to the Aiken Bill (S. 712). Among those heard were Watson Miller, the

Federal Security Administrator, who supported S. 712, and Ernest L. Stebbins, M.D., of Baltimore, Co-Chairman of a Committee on a Federal Department of Health, Education and Security sponsored by the American Council on Education and the National Social Welfare Assembly, also supporting the principles of a simplified bill like S. 712. The Conference of State and Territorial Health Officers was represented by Dr. Vlado A. Getting of Massachusetts, offering further support for S. 712. Organized medicine was represented by members of the Board of Trustees of the American Medical Association, who argued that it was unwise for public health to be associated with any other federal agencies and supporting a goal of a separate Department of Health with Cabinet status.

The American Public Health Association was represented at the hearings on March 24 by Reginald M. Atwater, M.D., Executive Secretary, who at the direction of the Executive Board of the Association pointed out that our organized facilities still lag far behind our potential ability to improve the public health, and that a large number of the social evils which we have been fighting in this country have their roots in bad health, and that Congress has wisely recognized this relationship by writing into the original Social Security Act provisions for making the federal services for health much more effective. In the long run, he said, it may easily be that these investments in health will represent some of the most significant features of our social security. After nearly twelve years' experience with the operation of the Social Security Act and such laws as Public Law 410, it is manifest that a structure of Cabinet rank is an essential to the importance of the task at the federal level. The Association recommended the immediate establishment of a Cabinet Department of Health, Education and Security to

be set up in a simple and flexible manner, allowing wide latitude for the adaptation of administrative structure to scientific advance.

Dr. Atwater said that, in the opinion of the Association, the present scope and character of the Federal Security Agency clearly indicates that this is the agency of the Federal Government which should have departmental status and a permanent place in the Cabinet. This seemed true whether the scope and character are measured in terms of federal financial involvement, the number of persons concerned, or in the importance of health, education and welfare.

It seems appropriate that the agencies dealing with health, education and security at the federal level should be thoroughly coördinated because corresponding agencies at the local and state levels are so generally separate and distinct. A first rate example of coördination in the proposed federal department would be useful.

It was recommended that the existing Federal Security Agency be converted to an executive Department by transferring the powers and duties of the Agency and its administrator to the new Department and to its Secretary. The matter of transferring any additional functions or units of other governmental agencies performing related services should be left for subsequent legislative action. The Association believes that the functional operating divisions or other units of the Department should be headed by career officers with high professional and administrative competence in their particular fields. These latter positions should be non-political in character.

It was recommended that the legislation should carry an expression of intent to insure freedom of state and local agencies, public or voluntary. Of equal importance, however, it should be clear that this legislation does not interfere with the administration of federal funds

in an orderly and non-political manner as provided, for example, by the 1939 amendments to Title V of the Social Security Act. Early passage of Senate Bill 712 was recommended as the best means of accomplishing these purposes.

The Association recommended against the provisions of Senate Bill 140 in so far as it divides the proposed Department into three separate and distinct divisions, each headed by an Under Secretary, because this would tend to separate the functions of health, education and security instead of promoting their coördination. It was pointed out that such programs as school health, vocational rehabilitation, and the care of crippled children certainly represent a desirable interlocking of health, education and security interests.

Dr. Atwater said that the professional society of public health workers finds itself of the opinion that it is unwise to provide as in S. 140 that the Under Secretary for Health shall be a licensed physician. It is the Association's opinion that under the American form of government the Assistant or Under Secretaries generally represent broad public interest and policy determination, while the Bureau Chief is a technical and professional person. It is believed that these functions would be confused if combined in a single individual. In the Division of Health as provided in S. 140, further administrative difficulty might readily arise from placing a technical person whose qualifications are only that he must be a licensed physician in a position above such a highly trained and specialized professional person as the Surgeon General of the United States Public Health Service.

In summary, the American Public Health Association supported the idea of Cabinet status for the Federal Security Agency in approximately its present form and registered itself as in favor of Senate Bill 712 as an acceptable means of obtaining this end.



DR. MCGAVRAN APPOINTED DEAN AT  
UNIVERSITY OF NORTH CAROLINA

Edward G. McGavran, M.D., M.P.H., now Professor of Public Health and Preventive Medicine at the University of Kansas School of Medicine, Kansas City, has been appointed Dean of the School of Public Health at the University of North Carolina, Chapel Hill. Dr. McGavran succeeds the late Milton J. Rosenau, M. D., who died April 9, 1946.

Dr. McGavran is a graduate of the Harvard Medical School and of the Harvard School of Public Health. He has served in Michigan, West Virginia, and St. Louis County, Missouri, before assuming his present duties in 1946. Dr. McGavran is a member of the Executive Board of the American Public Health Association.

NEW BOLIVIAN PUBLIC HEALTH  
ASSOCIATION

Announcement has been received of the organization as of January 1, 1947, of the Bolivian Public Health Association. It is described as an organization made up of members of those professions in Bolivia that are related to preventive medicine, hygiene, and sanitation, for the purpose of improving the sanitary conditions of the country. Its officers are:

*President:* Dr. Nemesio Torres-Muñoz  
*Vice-President:* Dr. Israel Zegarra  
*Secretary-General:* Dr. Miguel Lévy  
*Treasurer:* Dr. César Moscosco

MUNICIPAL CONSTRUCTION PLANS  
EMPHASIZE SANITATION PROJECTS

Evidence of the widespread municipal interest in structures and installations contributing to the promotion of public health can be found in the Federal Works Agency Advance Planning Program as of December 31, 1946.

The 1,776 projects representing 31.3 per cent of the total dollar value of completed design plans are for sewer,

water and sanitation facilities; 2,226 projects representing 24.3 per cent of the total dollar value of project plans now under design are in the same category. These proposed improvements occupy first place in both number of projects and dollar value.

State sanitary engineers have been active in assisting municipalities in the procurement of F.W.A. assistance in the preparation of such plans.

Other types of projects aiding public health include 138 completed plans and 206 in design for hospitals and health facilities.

FRENCH PUBLIC HEALTH HONOR  
TO DR. HENNESSY

Harold R. Hennessy, M.D., C.P.H., Assistant Secretary, Council on Industrial Health, American Medical Association, Chicago, Ill., has recently been notified that the President of the French Republic, on the recommendation of the Minister of Public Health, has issued a decree pronouncing him "Chevalier de l'Ordre de la Sante Publique." Dr. Hennessy, a Colonel in the Medical Reserve Corps, participated in the allied planning for the public health program of France assisting in the reestablishment of the French public health system, particularly the problems associated with displaced persons, refugees and returning French prisoners of war.

CHEST X-RAY PROGRAM IN NEW ORLEANS

February was federal month in New Orleans. The personnel of 71 federal agencies located in New Orleans participated in the mass chest x-ray program sponsored by the New Orleans Health Department and the New Orleans Tuberculosis Association. In spite of cold and rain, in spite of the Carnival season and Mardi Gras, more than 8,000 persons had chest x-rays. Preparatory educational meetings were conducted in many of the agencies. In

this survey, as in other mass x-ray surveys in New Orleans, the individual x-rayed was informed by letter of the result. This program was conducted by Robert L. Smith, M.D., Director of Tuberculosis Control and Milton E. Kossack, Director of Health Education for the Health Department; and by Miss Maretta Rocquet for the Tuberculosis Association.

#### KANSAS PUBLIC HEALTH ASSOCIATION ANNUAL MEETING TO BE MAY 27-28

The annual meeting of the Kansas Public Health Association will be held May 27-28, with headquarters in the Allis Hotel, Wichita. Charles A. Hunter, Ph.D., President of the Association, announces that C. H. Kinnaman, M.D., State Epidemiologist, will be the honor guest.

#### VIRGIN ISLANDS EXTENDS HEALTH SERVICES

Following the extension of federal aid to the Virgin Islands for Maternal and Child Health and Crippled Children's programs, John S. Moorehead, M.D., M.P.H., has been appointed Director of these two services in the Islands. The following additions have also been made to the staff of the St. Thomas Department of Health:

Peter Sabatelle, M.D., Orthopedic Surgeon  
Laura L. Moorhead, R.N., Director of Public Health Nurses  
Viola Collins, R.N., Maternal and Child Health Nurse  
Magdalane Clark Wainright, R.N., Public Health Nurse

#### ADVERTISING COUNCIL'S TUBERCULOSIS PROGRAM

The May *Bulletin* of the National Tuberculosis Association announces definite plans for a year-round educational campaign on tuberculosis by the Advertising Council. In coöperation with the National Tuberculosis Association, its affiliated associations, and the U. S. Public Health Service, the

campaign will be launched in the fall. It will use the channels of public education available to advertising—radio, newspapers, magazines, including farm, trade, and professional journals, posters, etc. The main emphasis of the campaign will be the necessity of periodic chest x-rays for the entire adult population.

The Advertising Council was organized in 1942 to bring the combined services of advertising agencies to the various volunteer war efforts, bond selling, enlistment, community chest, and many others. It is a "non-profit organization representing all phases of advertising, dedicated to the use of advertising in the public services." It is currently sponsoring campaigns for the National Safety Council, the Federal Housing Administration, and the World Trade Foundation, among others.

#### DR. WEST RESIGNS AS PRESIDENT-ELECT OF AMA

On April 1 Olin M. West, M.D., resigned as President-Elect of the American Medical Association because of ill health. Dr. West, who was formerly Tennessee State Health Officer, served for many years as Secretary and General Manager of the American Medical Association, a position from which he retired in 1945 at the age of 70. He was to have been inaugurated as President at the 1947 annual session.

Dr. West is being succeeded as President-Elect by Edward L. Bortz, M.D., of Philadelphia. Dr. Bortz, who is Associate Professor of Medicine at the University of Pennsylvania Graduate School of Medicine, will become President at the Annual and Centennial meeting in Atlantic City, June 9-13.

#### NATIONAL NURSING COUNCIL STUDIES NURSING JOBS

Under a grant of \$28,000 from the Carnegie Corporation, the National Nursing Council is making an intensive

study of the nurse's job and the necessary changes in education required to prepare her for it. The study will be preceded by a week long nurses' workshop whose aim is to define the rôle of the registered nurse. The workshop will bring together nurses from all over the country representing public health, industrial nursing, and hospital care, as well as consultants from medicine, social work, and allied fields. The study, designed to find an answer to the nurse shortage, will focus on the problem of how a basic professional nursing school should be organized, administered, and financially supported to prepare its graduates adequately to meet community needs. Dr. Esther Lucile Brown, who is director of the Department of Studies in the Professions of the Russell Sage Foundation, will conduct the study.

#### DR. BAUMGARTNER COMPLETES TEN YEARS OF CHILD HEALTH WORK

On March 25 in New York a group of organizations and individuals gathered for luncheon. They were there to take note that Leona Baumgartner, M.D., has completed ten years as Director of the New York City Department of Health's Bureau of Child Hygiene. The sponsoring organizations were a baker's dozen; the individuals some 300, representing a variety of medical and lay approaches to the problem of child health.

C.-E. A. Winslow, Dr.P.H., summarizing the ten years of progress, pointed out that if the same infant rate had prevailed in 1946 as in 1908 when the Bureau of Child Hygiene was first organized by the late Josephine S. Baker, M.D., 17,000 babies would have died. Actually only 4,000 did.

Dr. Baumgartner herself talked of the things still to be done—research into the cause and prevention of stillbirths of which there are annually 10,000 in New York City; universal care for pre-

mature births of the quality that only best doctors and hospitals now give; reduction of the infant mortality rates in some of the underprivileged areas of the city; "the rate is as high in Harlem as in some of the poorest southern states."

Donovan J. McCune, M.D., Chairman of the Health Section of the Citizens' Committee on Children, presented a report of his committee, "Citizens Look at Their Services for Children."

#### NEW ENGLAND HEALTH INSTITUTE

The first Post-War Institute will be held at the University of New Hampshire June 16-18. There will be nine section and joint sessions, a luncheon, a banquet, and a dance. Make reservations through the Business Office of the University, Durham, N. H.

#### TWO NEW CARE PACKAGES

CARE (Cooperative for American Remittances to Europe) announces three new \$10 packages. The CARE woolen package contains 3½ yards of all woolen cloth. Heavy cotton lining, thread, buttons, needles, and thimble are included.

The CARE blanket package includes two all wool blankets, two pairs of heels and soles, a pair of scissors, an assortment of pins, needles, threads, yarns, and a thimble and comb.

The CARE cotton package contains 4 yards each of white broadcloth, of pink or blue broadcloth, and of printed dress material; 2½ yards each of printed shirting and navy drill, as well as thread, needles, scissors and thimble. Care, 50 Broad Street, New York 4.

#### PERSONALS

##### Central States

D. C. BARRETT, M.D., M.P.H.,† has been appointed Director of the Bureau of Local Health Administration in the Indiana State Department of Health.

GLADYS KRAUSE has resigned her position as Director of the Division of Vital Statistics in Nebraska. CLAIR L. CHISM is the new registrar.

HOWARD E. LIND,† formerly Research Bacteriologist with the Dow Chemical Co., Midland, Mich., has resigned to accept a position as Director of the Sias Laboratories, Brooks Hospital, a diagnostic research and consultative hospital in Brookline, Mass.

ELTA MAE MAST† has recently been appointed to serve as liaison officer between the Health and Physical Education Division of the Office of the Superintendent of Public Instruction and the Division of Public Health Education of the Department of Public Health, State of Illinois.

LYDIA REITZ† has been appointed Educational Director for the Division of Public Health Nursing of the Illinois State Department of Public Health.

LEONARD SCHUMAN, M.D.,† has been appointed to the position of Chief of the Division of Venereal Disease Control in the Department of Public Health, Illinois. Dr. Schuman had previously served as District Health Superintendent with headquarters at Woodstock, Ill., and as Assistant Chief of the Division of Local Health Administration in the Department.

CECIL A. Z. SHARP, M.D.,\* has accepted the positions of Health Officer of the St. Louis County Health Department, Clayton, Mo., and Assistant Professor of Preventive Medicine at the Medical School of Washington University, St. Louis, Mo.

GEORGE A. SHERMAN, M.D., Director of the Michigan State Health Department, Bureau of Tuberculosis Control since 1941, has resigned to enter private practice as of March 1, 1947.

FRED O. TONNEY, M.D.,† formerly

District State Health Officer for the Northern Illinois area, was appointed City-County Health Officer at Mansfield, Richland County, Ohio, effective January 1.

DONALD W. TRIPODI, M.D., has been appointed by the Local Board of Health as Health Officer of the Alexander-Pulaski Bi-County Health Department (Illinois) effective February 1, 1947. The Alexander-Pulaski Bi-County Health Department with headquarters at Cairo, was permanently established by popular vote on November 5, 1946, when 17 counties voted in favor of county or multiple county health departments. Besides Dr. Tripodi, two other new members were appointed to join the staff, EMMA JENNINGS, R.N., has been appointed as Public Health Nurse, and RALPH GIBSON, Cairo, as Sanitarian.

BEN L. WILLIAMSON\* has been appointed Director of the Division of Sanitation, Kansas State Board of Health. He is currently Assistant Engineer in the Iowa State Health Department. DWIGHT METZLER,† Assistant Director of the Sanitation Division, has been appointed Acting Director until the arrival in Kansas of Mr. Williamson.

EARL J. WINTERS, formerly chief technician of the x-ray service of the Cuyahoga County Tuberculosis Clinic, Cleveland, O., has been appointed field assistant of the New York Tuberculosis and Health Association's chest x-ray service. Mr. Winters will schedule the association's mass x-ray projects and will emphasize extension of this work among business and industrial concerns in Manhattan, New York City.

JOHN S. WISELY, M.D., has resigned his position with the Molly Stark Sanatorium, Canton, Ohio, to accept

\* Fellow, A.P.H.A.

† Member, A.P.H.A.

the position as Director of Tuberculosis Control with the Cattaraugus County Department of Health, Olean, N. Y., and Superintendent of Rocky Crest Sanatorium.

#### Eastern States

ABRAHAM Z. BARHASH, M.D., New York, has been appointed Director of the Division of Community Clinics of the National Committee for Mental Hygiene, succeeding MILTON E. KIRKPATRICK, M.D.

MARGUERITE M. FUREY, R.N., has been appointed by the National Society for the Prevention of Blindness, New York, N. Y., as Consultant in Nursing Activities.

#### APPOINTMENTS IN THE MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH:

EUGENE R. SULLIVAN, M.D., has been appointed an Assistant Director, Division of Biologic Laboratories. Dr. Sullivan served 3 years overseas as Chief of Laboratories, 6th General Hospital, as consultant on blood and blood transfusions for the North African and Mediterranean theatres of operation. He was awarded the U. S. Legion of Merit and the Order of the Crown of Italy, Degree of Knight-Commander.

BARBARA FORD CARTER, M.D., former House Officer and Assistant Resident, Boston City Hospital, has been appointed Assistant District Health Officer of the North Metropolitan District.

MARTHA HOWARD FALES, B.A.,† formerly dental health consultant, Michigan Department of Health, has joined the staff of the Division of Dental Health, as Public Health Dental Hygiene Supervisor.

SALVATORE R. TRAINA, M.D.,† former Command Surgeon of the 7th

Air Service Area Command in Tokyo, is now Physician in charge of the mobile unit of the State Blood Donor Program, Division of Biologic Laboratories.

JULIAN M. KARASOFF, D.V.M., has been appointed Veterinary Food Inspector in the Division of Food and Drugs. Prior to his appointment, Dr. Karasoff practised privately as a veterinarian.

MARY STEICHEN, M.D., M.S.P.H.,\* New York City, has been appointed Acting Medical Director of the Planned Parenthood Federation of America, Inc.

W. T. S. THORP, V.M.D.,† Professor of Veterinary Science at Penn State College, State College, Pa., has been appointed to the staff of the National Institute of Health, Bethesda, Md., to head a veterinary section in the Pathology Division.

STAFFORD L. WARREN, M.D., Professor of Radiology at the University of Rochester, N. Y., School of Medicine and Dentistry, and during the war Chief of the Medical Division for the entire atomic bomb project under the Manhattan District, has been appointed Dean and Professor of Biophysics of the new Medical School on the Los Angeles campus of the University of California. He will supervise plans for the medical school buildings and university hospital of 500 beds to be built on the Los Angeles campus, and assemble a faculty and staff for the new institution. The State of California already has appropriated \$7,000,000 for the project and additional funds have been requested from the current Legislature.

#### Southern States

PAUL C. CAMPBELL, JR.,† Surgeon, U. S. Public Health Service, has been appointed Chief of the Office of Dermatology, Industrial Hygiene

\* Fellow, A.P.H.A.

† Member, A.P.H.A.

Division, U. S. Public Health Service, Federal Security Agency. Dr. Campbell succeeds LOUIS SCHWARTZ, M.D.,\* who will retire on July 4 after 41 years of service.

SURGEON GEN. HUGH S. CUMMING,\* (retired), U. S. Public Health Service, Washington, D. C., was elected director emeritus, at the 12th Pan American Sanitary Conference in Caracas, Venezuela, of the Pan American Sanitary Bureau after 26 years of active service as director. Gen. Cumming retired as director of the bureau on January 21 and FRED L. SOPER, M.D.,\* of the Rockefeller Foundation, New York, assumed the office.

PAUL HANEY, M.S.E.,\* has begun his new work as Professor of Sanitary Engineering at the University of North Carolina. During the past 15 years he has been with the Kansas State Board of Health, since 1942 as Director and Chief Engineer of the Division of Sanitation.

MERLE P. MOON, PH.D.,\* has resigned his position at the University of Missouri to assume a position with the Kentucky State Medical Association in Louisville which includes responsibility as Associate Editor of the State Medical Journal.

#### APPOINTMENTS IN THE NEW ORLEANS HEALTH DEPARTMENT:

SIM B. SHATTUCK† has been appointed Acting Director of Bureau of Vital Records. He was formerly with Louisiana State Health Department as Chief of Registration and Records.

LILLIAN S. HAWES, R.N., has been appointed Education Director, Bureau of Public Health Nursing. Miss Hawes most recently was with the War Relocation Authority as

Chief Nurse of Nursing Service, Manzanor, Calif.

OLIVIA SMYTHE, R.N.,† has been appointed Consultant on Maternal and Child Health, Bureau of Public Health Nursing. Miss Smythe was formerly with the U. S. Army Nurse Corps—126 Station Hospital, Southwest Pacific.

JAMES G. FAUSTINA† has been appointed Supervisor of Health Education. He was formerly Health Education Consultant, U. S. Public Health Service.

ANDREW P. SACKETT, M.D., Medical Officer in charge of Kanawha Valley Medical Center (VD), South Charleston, W. Va., has been appointed Acting Director of the Bureau of Venereal Disease Control in the State Health Department. Dr. Sackett will continue as Medical Officer in charge of the rapid treatment center in South Charleston.

LOUIS SCHWARTZ, M.D.,\* Chief, Office of Dermatology, Industrial Hygiene Division, U. S. Public Health Service, will retire from the Service on his 64th birthday, July 4, 1947. Dr. Schwartz has been serving the public for more than 41 years. He has been instrumental in focusing attention on dermatological problems in industry.

CHARLES P. STEVICK, M.D.,† former Director of the Bureau of Vital Statistics in North Carolina, has again assumed this position. Dr. Stevick will also resume the duties of registration executive.

MELVILLE A. TAFF, JR.,† Registrar in Louisiana, has joined the staff of the National Office of Vital Statistics. Mr. Taff will be a member of the Latin American Consulting Staff and will be in the States for orientation about 2 months before leaving the country.

RAYMOND A. VONDERLEHR, M.D.,\* has been appointed Medical Officer in

\* Fellow, A.P.H.A.

† Member, A.P.H.A.

charge of the Communicable Disease Center of the U. S. Public Health Service at Atlanta, Ga. Until recently he was in charge of District 6 of the Service with headquarters in San Juan, Puerto Rico.

CLARENDON B. WOODS, M.D., Washington, D. C., has been appointed Health Officer for Hampton and Colleton Counties, Ga., with headquarters in Walterboro.

#### Western States

J. P. CLEARY, M.D.,† has been appointed Director of the Division of School Hygiene, Portland, Ore.

ELEANOR MATSUMATO, formerly with the Farm Security Administration in Hilo, has been appointed nutritionist for rural Oahu by the Hawaii Territorial Board of Health.

ROBERT J. M. HORTON, M.D., M.P.H.,† has been appointed full-time Medical Health Officer for Kauai County, H. I. Dr. Horton, recently discharged from the U. S. Army Medical Corps, has just completed his public health work at the Harvard School of Public Health.

#### Canada

JOHN LLEWELLYN LITTLE, M.D., of the staff of the Directorate, Health Insurance Studies, Department of National Health and Welfare, Ottawa, Canada, was a recent visitor at a meeting in New York of the A.P.H.A. Subcommittee on Medical Care.

#### Foreign

MARIO CIOLLI, M.D., of Havana, Cuba, has been appointed Director of the Division of Pan American Medical and Health Relations of the Finlay Institute by Ramon Grau San Martin, President of the Republic of Cuba.

ARTHUR MASSEY, C.B.E., M.D.,\* has

resigned as Medical Officer of Health and School Medical Officer of Coventry, England, to become Chief Medical Officer to the Ministry of National Insurance, whose office is at 6, Carlton House Terrace, London, S. W. 1.

#### Puerto Rico

EDUARDO GARRIDO-MORALES, M.D.,\* San Juan, former Health Commissioner of Puerto Rico, has been appointed to act as local director for the Hospital Facilities Division, U. S. Public Health Service, and to act also as consultant to antivenereal and antituberculosis programs that are being conducted in the Island with federal and insular funds.

#### Death

GEORGE T. PARKINSON, M.D., Health Officer, South Central District Health Unit, Twin Falls, Idaho, died March 1 of coronary occlusion.

#### CONFERENCES AND DATES

American College of Hospital Administrators: Third Fellows Seminar. University of Washington, Seattle, Wash. May 5-9.

Third New England Institute for Hospital Administrators. Brown University, Providence, R. I. June 19-28.

Maritime Institute in Hospital Administration. St. John, New Brunswick, Canada. June.

Third Western Institute for Hospital Administrators. Stanford University, Palo Alto, Calif. August.

Fifteenth Chicago Institute for Hospital Administrators. University of Chicago, Chicago, Ill. September 2-12.

Annual ACHA Convocation and General Assembly of Membership. St. Louis, Mo. September 21-22.

American Congress of Physical Medicine. 25th Annual Scientific and Clinical Session. Hotel Radisson, Minneapolis, Minn. September 2-6.

American Dental Association. Annual Meeting. Boston, Mass. August 4-8.

American Dietetic Association. Philadelphia, Pa. October 13-17.

American Hospital Association. Annual Convention. St. Louis, Mo. September 22-25.

\* Fellow, A.P.H.A.

† Member, A.P.H.A.

# American Journal of Public Health

## and THE NATION'S HEALTH

---

Volume 37

June, 1947

Number 6

## What Is Health Education?

A Symposium Prepared at the Request of the Editorial Board

W. W. BAUER, M.D., F.A.P.H.A.

*American Medical Association, Chicago, Ill.*

HEALTH education is the sum total of all our experiences and motivations which add to health knowledge or influence health behavior.

Health education is much bigger and broader than what we commonly think of when this term is used. Teaching in the schools about health is health education. So also is some of the indiscriminate radio listening done at home. Living in the home or school constitutes health education for better or for worse. If school environment, either physical or psychological, clashes with theoretical teaching then we may have health education of a negative sort.

Health education includes a great deal of influence derived from commercial sources. The high place held by citrus fruits in our diet is due only in part to an appreciation of their dietary value and much more to the initiative, enterprise, and competitive zest of the fruit growers of California, Arizona, Texas, and Florida. In the same way, the acceptance of coffee as a national drink and the tremendous use of soft drinks is a reflection of our health education ex-

perience as a whole. Whereas the use of citrus fruits, for example, indicates a positive balance of forces, the excessive use of coffee and the widespread abuse of tobacco represent a negative balance in the forces which determine the resultant conduct of the individual.

Health education has two principal components: information and motivation. Information may be all true, part true, part false, or all false, according to Donald B. Armstrong's classification in his article "Can It Now Be Told?"\* Motivation may be positive or negative and this may depend in part on information. Mere giving of information or its passive acceptance is only a part of health education because it does not inspire conduct and, therefore, leaves the situation essentially unchanged. Conduct is inspired by the urge to do something. This urge may be based on fear, ambition, jealousy, determination, malice or any combination of these or other emotional drives. In health education, as in religion, there is no action unless motivation takes place.

\* *Health & Phys. Educ.*, VI, 6 (June), 1935.



## HERMAN N. BUNDESEN, M.D., F.A.P.H.A.

*President, Board of Health, Chicago, Ill.*

What is health education? To my way of thinking, health education is a matter of teaching the community and the individual how to guard against health hazards. It is up to the health department to protect public health just as it is up to the police to insure public safety, and up to the home, church, and school to set good standards of behavior.

In Chicago, we provide among other facilities laboratory services, infant welfare clinics, treatment and isolation for communicable diseases, and school hygiene service. The value of these facilities to the public depends on the use the public is taught to make of them.

We use the direct approach; we frankly advertise Health Department services. With 3,500,000 people to educate, we follow the example of the successful business enterprise with a product to sell.

Our "product" is public health service. We publish simple, graphic material about every phase of public health and build special publicity campaigns to combat new health problems as they arise. Over the years, the public attention we have focused on infant welfare has been an important factor in maintaining our low infant mortality rate. The backbone of this campaign has been the widespread distribution of accurate, detailed, but easy-to-read literature.

In a health education drive against

diphtheria, the entire health department staff took to the field for a city-wide canvass of families with preschool children who had not received toxoid inoculations.

A current example of our education tactics is our VD control program. In VD, we had a health problem the public had long preferred to ignore. Led by the *Chicago Tribune*, the press helped us launch our campaign in 1937.

Last February — "VD Control Month" by proclamation of the Mayor — our public information drive co-sponsored by the Chicago Junior Association of Commerce included car card advertising and radio as well as newspaper coverage. The 50,000 VD tabloids handed out to Loop shoppers and workers as a publicity stunt were pocketed readily whereas twelve years ago, few people would have accepted them.

During the war, we developed an education program for the city's 8,000 liquor licensees to deal with the promiscuous encounters leading to VD which were taking place in taverns. Not only did the owners cooperate, they underwrote the printing and distribution of 3,000,000 matchbooks with VD control copy.

These few illustrations represent the kind of health education we are doing in Chicago and the kind we are finding successful.

## MARY P. CONNOLLY, F.A.P.H.A.

*School of Public Health, University of Michigan, Ann Arbor, Mich.*

Health education is that process by which persons become aware of health needs and practices which they may establish to meet these needs. Certain

of these practices are dependent upon facilities.

Who is responsible for health education? The physician in his office when

he indicates a way of life to a patient; the dentist when he instructs a patient regarding means to prevent tooth decay; the school teacher when she provides education that will cause students to take on attitudes and habits that will promote health; the health officer who recognizes that City Fathers and county supervisors must understand health problems and the means of solving them if money is to be appropriated to support public health administration. The public health engineer and the sanitarian are responsible for health education in their efforts to establish safe water and milk supplies and adequate housing for families. The public health nurse employs health education as her tool to

help mothers to seek prenatal care for themselves and preventive medical care for their children. The health educator promotes health education when he interests citizens in taking responsibility for health promotion projects. In addition, the health educator utilizes the media of publicity to make persons sensitive to health problems in order that they will seek education to solve these problems.

In a democracy, people perform as they understand. Understanding comes from participation. Everybody can learn on some level, and participate on some level. The various levels will add up to a healthy citizenry. This summary is my understanding of health education.

### MAYHEW DERRYBERRY, PH.D., F.A.P.H.A.

*United States Public Health Service, Washington, D. C.*

Some of the others contributing to this symposium have thoroughly described the wide variety of activities that are incorporated in a program of health education. Such a definition considers health education from the point of view of the professional worker. It is a series of things that are done to, and for, people with the purpose of improving their health information, attitudes, and behavior. Certainly any adequate answer to the question "What is health education?" must include a full recognition of these tools and techniques in the program.

In addition, however, health education may be considered from the point of view of the public or layman. As such it is the *change* that takes place in his knowledge of scientific health facts, in his attitudes toward preventive and curative health practices, and in his daily living habits as a result of his many experiences. It is the knowledge gained about microorganisms and their

role in disease from reading an article on the subject; it is the public support given a health department because of its effective work on an epidemic; it is the appreciation of a doctor's diligent medical attention in a severe illness; or it is the visit to a cancer detection clinic after attending a cancer field army meeting.

But not all the changes are so favorable. Some are negative, as for example the resistance built up to clinic attendance as a result of long waits on hard benches and little help on personal health problems, or the feeling of futility that comes from participation in a blood survey or diabetes survey when no information on the individual results is given, or the use of an onion and bacon poultice on a swollen limb on the advice of a neighbor, or the lack of confidence in a periodic medical examination when a very superficial inspection is given.

Because many of the services which

the public receives from medical and public health personnel are charged with emotional reactions of fear and anxiety, they have great potentialities for health education. If the service is rendered in a pleasant manner and meets the need of the individual *as he sees it*, favorable attitudes (positive education) will result.

Conversely, only one unsatisfactory experience is sufficient to develop resistance and distrust, which is very difficult to overcome through any edu-

cational effort (negative education).

This consumer reaction phase of health education has been emphasized because the effectiveness of strictly educational efforts is greatly enhanced when medical and public health services are rendered in a manner satisfactory to the people.

Health education then is not only the activities of the professional public health workers, but also the reactions of the people to *all* their experiences with health significance.

### THOMAS D. DUBLIN, M.D., DR.P.H., F.A.P.H.A.

*Professor of Preventive Medicine, Long Island College of Medicine,  
Brooklyn, N. Y.*

Progress in medicine and public health cannot be judged solely in terms of monumental scientific discoveries or of important technical advances in methods of diagnosis, treatment, and prevention of disease. It must be measured also by the speed and completeness with which available knowledge and skills are applied to the total health and medical needs of all members of society. There can be no question that ignorance, fear, superstition, and indifference create an imposing barrier between what modern society is prepared to accomplish and what is actually being done to protect and improve the health of the individual, his family, and the group as a whole.

If this barrier is to be broken down, the medical and health professions must devote even greater energies than in the past to the education of the public in the proper use of the tools which science and technology have fashioned.

Public health is turning progressively toward those health problems which can be solved only by dealing directly with the individual. Simultaneously the basis for medical care is gradually shifting from palliative and curative measures

to the socially far more valuable pursuits of prevention of illness and the maintenance of health. These changes have already broadened the horizon of health education to include a concept of health as more than the mere absence of disease but rather as a state of social, psychological, as well as biological, adjustment of each individual to his total environment. Accordingly health education must assume its proper place as a highly personal service motivating the individual toward healthy living; arousing social action to create conditions conducive to health within every community; and developing awareness and stimulating effective use of the vast health and medical resources which an enlightened society provides to meet the fundamental needs of its members.

With increasing specialization of health and medical services we have established a group of technically trained workers, and others not so well equipped, and have assigned to them the task of educating for health. In so doing we have almost forgotten that by definition the physician is the teacher and health educator of those whom he serves. Though he is no longer the sole provider

of professional care and now represents only one in ten of those engaged in health and medical services, it is still to him that the individual first turns for help and guidance. It is clearly the physician's task to direct, correlate, and supervise the work of all other workers in the health field and to aid his patients in utilizing available skills. In these relationships alone, the physician has an unparalleled opportunity, as well as an obligation, for health education.

In recent years special schools and special classes have been established to train professional health educators for their appointed tasks. At the same time we have neglected this phase of the education of the one individual through whom all health services should properly be channeled. Health education is inescapably a major function of the physician, and yet it is an activity for which he, at present, is least prepared by training and experience.

### ELIZABETH G. FOX, R.N., F.A.P.H.A.

*Executive Director, Visiting Nurse Association, New Haven, Conn.*

Others will expound the virtues of popular health education. And, when scientifically accurate and psychologically sound, mass education assuredly has its place. Perhaps it is most effective in those areas where there is little conflict with deeply rooted patterns of living and personality needs and where the pressure of social usage is greatest—for example, in creating popular acceptance of the value of immunization. But when the going is hard, when the individual course of action is inconvenient, difficult, disagreeable, or expensive, natural inertia and emotional resistance are easily rationalized. Something more than knowledge is needed to overcome them.

Fitting general principles to one's own particular requirements and means, or to the circumstances, ways, and feelings of one's family often calls for individual instruction suited to the specific situation. The taking of insulin and arrangements for a diabetic diet is a good example, or the putting into practice of the principles of child health in the daily rearing of one's own children.

When action is called for, which is painful for emotional, social, or financial reasons, motivation becomes a

highly personal matter. Some individuals are so well balanced that they can come to terms with the situation and take action without aid. Even with these individuals, the price may be undue expenditure of emotional energy.

For many others, when the situation is fraught with known and unknown obstacles—fears, social pressures, the threat of a break in personal relationships, or wholly unconscious factors—the individual becomes driven by emotion, and reason plays little part in his reactions. In such instances a counselor is needed who understands, at least in part, the art of attentive listening and of helping the person concerned to express and accept and deal with emotions blocking action. Such counseling, when safeguarded by medical knowledge, is personal health education at its best.

Let popular health education, then, prepare the ground and sow abundant seeds. But for the painstaking cultivation, let us turn to the individual counselor. It is he or she who translates general knowledge into familiar terms related to the particular individual's personality and circumstances. It is he or she who, with friendly understanding, helps the individual to make practical

application of medical truths and to meet some of the emotional hurdles in his way.

Amidst the manifold diversities of individual lives, personal health coun-

seling by the physician or public health nurse—the ancient way of one pupil and one teacher sitting down together and talking over a live situation—surpasses all other methods.

## HOWARD WHIPPLE GREEN, F.A.P.H.A.

*Secretary, Cleveland Health Council, Cleveland, Ohio*

The education of the public toward good health is a community program of considerable magnitude. Most decreases in the death rate resulting from improved water and milk supplies and the like have already been realized.

This means that further reductions in the death rate are dependent upon what individuals do for themselves. This in turn is dependent upon what they know, are taught, and made to desire. All available methods of health education are put to work to help influence as well as teach the thousands of individuals who make up a community.

The status of health of inhabitants of an area must be determined by careful statistical studies in order to serve as the basis of sound local health education programs.

Health education to be effective must be directed toward specific groups of individuals whose educational and intellectual levels are known. Teachers, college students, school children, patients, and the general public each present a different problem. Knowledge as to the grade of school completed by various segments of the adult population is also most helpful in planning health education programs which are within the grasp of various segments of the population.

Health education must be based upon detailed knowledge of the specific subject to be treated as, for example, diph-

theria. The fact is that if a child is immunized before his first birthday, he does not contract the disease. Since babies cannot receive health education—and if they could, could do nothing about being immunized—the individuals to reach are their fathers and mothers; and there is little use in motivating them to have their infants immunized until private physicians and public health services are ready and anxious to serve.

Health education utilizes both the written word—direct mail, posters, bill boards, newspaper and magazine articles, and so forth—and the spoken word—speeches before all sorts of groups and the radio. It puts to use exhibits which appeal to the eye and exhibits which the visitors help operate. The material is taken to the individual citizen, the expectant mother, the mother with an infant or preschool child, the schoolchild, the youth, and the adult. Men, women, and children receive health education in an active health museum, in interesting lecture courses, health institutes, and so forth.

It is not enough to teach; health education must also play upon the basic human interests, such as love for children, desire for athletic strength, and pride in continuous work without loss of days from sickness. It should set up a goal of radiant, positive, good health as contrasted with mediocre or partial well-being.

## WILLIAM S. GROOM

*Director of Health Education, Public Health Federation, Cincinnati, Ohio*

To answer this question in four hundred words is a typical assignment for the health educator. Today he must condense the subject of cancer control into a car card. Tomorrow he is expected to tell all about tuberculosis in a two paragraph poster.

His is the task of teaching all that is useful and safe for the layman to know about that vast and complex body of knowledge called medical science. And he must accomplish this with the utmost brevity and simplicity; otherwise few will read or listen and fewer will understand and remember.

Having used the first hundred words to express his appreciation of the task in hand, he must now explain all about health education in the remaining three hundred.

In my judgment the primary purpose of health education is to disseminate authentic information and advice which the layman may employ to:

1. Promote optimal health
2. Escape preventable illness
3. Recognize certain symptoms which justify prompt investigation by a competent physician
4. Participate, as a citizen, in the organized health program of his community

Instruction of the ill in the management of their illness is without the province of the health educator. This

belongs to the physician and the nurse.

In promoting these four main objectives to the adult public, mass media must be employed and the health educator would do well to recognize the experience which commercial users have had with such media.

When an entire radio period is filled with a speech, a round table discussion, or an interview, all but a few listeners will tune into some other program. Likewise when a press "story" or other printed material is long and involved it will collect relatively few readers.

Too often we have achieved too little because we have attempted too much. If the layman is to read, to understand, to remember, and finally to employ our information and advice, we must not confuse him or tax his memory with more than the barest essentials. This rule applies to the great majority. On the other hand, there are some who will read the most lengthy and detailed health literature and believe themselves capable of lay diagnosis and self-medication.

There is an old rule of economics, "good enough is best." More than that is too costly and thus inefficient.

Let us try then to select and disseminate "that minimum of information which may provide a maximum of usefulness."

## SALLY LUCAS JEAN, R.N., F.A.P.H.A.

*Consultant in Health Education, National Foundation for Infantile Paralysis, New York, N. Y.*

Thirty years ago Health Education was a new term. Now this new tool for the promotion of public health is universally accepted.

Health education involves people. It converts them to accept scientific health

knowledge with such confidence that they will discard hearsay and tradition and adopt for their personal use only those health practices which have a scientific basis. As citizens they will be so concerned with the value of modern

health measures that they will make their voices heard at the polls and in the halls of legislation where many of the public services affecting our environment are determined.

Health knowledge is important to bring this about but knowledge alone is not enough, there are other factors to be considered. Excellent papers on all phases of health are submitted by students whose living habits continue unaffected. A few years ago a high school girl in the Philippine Islands wrote a splendid term paper on beriberi. She presented accurate statements as to whole grain rice and other easily obtainable foods as preventives just two weeks prior to her death from the disease.

A teacher in the New York City schools died within the last three years of hydrophobia, declining to accept treatment for rabies while there was still time for it to be effective. There were 16,192 cases of diphtheria in the United States reported in 1946, though a preventive has been easily procurable for twenty years.

The Philippine student, the teacher, and the parents of diphtheria patients had knowledge, yet had not been sufficiently impressed by the facts to apply them.

Training in health matters involves the creating and developing of attitudes favorable to the acceptance of such knowledge at a time when a readiness exists. Then, too, the process of educating youths in health varies with sex, age, and experience.

Experience probably influences health practices to a great extent. Health education attempts through every medium known to furnish information and to create receptive attitudes toward health facts, utilizing planned and incidental experiences.

Propaganda is often mistaken for education, and there is a legitimate place for propaganda in arousing interest in health; but in education the learner is active while in propaganda the recipient is passive.

In each generation the people have had to be educated to disbelieve much of the teaching of their progenitors and to accept newer knowledge. This is a laborious process. When youths can be so instructed that they will develop confidence in well documented scientific facts and be prepared to accept new truths, the health education of adults will be greatly facilitated but we will always have to develop those attitudes and interests which motivate sound health practices.

### BLEECKER MARQUETTE, F.A.P.H.A.

*Executive Secretary, Cincinnati Public Health Federation*

Health education is many things—not one.

To the teacher of physiology, it is giving instruction about the body and its functions. To the teacher of civics, it is the study of community health facilities and needs. To intelligent parents, it is guiding their children from birth in the knowledge and practice of sound habits of mental and physical health. To the public health minded

doctor, dentist, nurse, it is instructing patients as they see them in homes, offices, clinics, and hospitals in the prevention of disease and in the ways of health. To the health officer, it may be primarily acquainting the public with the methods by which his health department works for their protection and developing citizens' support for an adequate well staffed department.

To those concerned in a broad pro-

gram of health education, it means all processes by which citizens are taught essential truths about health with the specific purpose of: (1) Instilling habits of living that will promote physical and mental well-being. (2) Acquainting the public with health activities and health needs and developing support for a sound and comprehensive health program for the community, the state, and the nation.

But not all health education is of this beneficent type. The advertisement which subtly persuades the obese to use reducing drugs; the radio "plug" that makes a convincing appeal for a dentifrice guaranteed to whiten the teeth or retard caries; the movie that gives a completely distorted conception of psy-

chotherapy; the cultist who advertises some panacea to cure all ills; the quack, the nostrum vendor, and even the backwoods housewife who earnestly advises cobwebs for cuts and burns—all this is health education in reverse, but health education nevertheless. It is not to be discounted when we speak of education about health because these forces make a powerful appeal to the emotions and often with consummate skill. They exploit human desire for the easy way and the simple remedy.

One of the tasks of true health education is to offset these negative influences. Until we do, we shall never put fully into effect the invaluable tools for health that medical science continues to give us.

### LUCY S. MORGAN, PH.D., F.A.P.H.A.

*Professor of Public Health Education, School of Public Health,  
University of North Carolina, Chapel Hill, N. C.*

Through the years, definitions of health education have been more or less influenced by prevailing concepts in the two fields concerned—health and education.

Some persons have visualized health education as classroom instruction; others have thought of it as medical inspection in the schools, sanitary inspection of the environment, or physical education; others have seen it as publicity, a visit from the public health nurse, or listening to a lecture; and still others have encompassed the entire school or community health program in their interpretation of the term. Individual definitions have varied from the specific to the all-inclusive; but in an atomic era, when man's concern lies in *world* health, it is logical to seek a definition in terms of a total health education program for *all* people, and to attempt to find a mooring for it in the natural laws of human existence.

It is man's fundamental right to achieve the maximum health for which he is biologically capable, but to attain this he must learn to cope successfully with his physical and social environment. In the past such an adjustment to living has not been possible, because scientific knowledge has not been translated into everyday language and action. Therefore, one of the immediate objectives of a total health education program is to help bring scientists, educators, and laymen together so that each will understand the other and so that all can learn to work as a unit toward a common goal—positive health for *all* people. In addition to being concerned with this immediate objective, health education must help man to understand the problems of human behavior in relation to the uncompromising laws of nature and must help him recognize his importance in the universal scheme.

Such a program of health education,



or education for living, calls for a re-direction of the teaching of health and education, away from peripheral specialties and superficial efforts in organization and techniques, to a program which will apply scientific knowledge to

everyday living and make it possible for each individual to become a contributing partner in a world where not only man's health but his very existence depends upon his opportunity to think, observe, and plan in terms of all people.

### DOROTHY B. NYSWANDER, PH.D.

*School of Public Health, University of California, Berkeley, Calif.*

*Health education* has become an ambiguous term, signifying to one person the health teaching procedures which are carried out in behalf of people; to another an intangible summation of experiences which have left their mark on a person's behavior with respect to health. Still a third concept is that health education is a process of change within the human organism itself which is related to achieving personal and community health goals. It is to this third definition of health education that this writer subscribes.

The question seems to be this: Is health education synonymous with health teaching or is education in health (health education) a process of learning (a process of self-building)? Teaching and learning are not the same thing. In the last analysis learning takes place only through the efforts of the learner. Thus, health education cannot be "given" to one person by another; it is not a set of procedures to be carried out or a product to be achieved; rather it is a dynamic ever-changing process of development in which a person is accepting or rejecting new information, new attitudes, and new practices concerned with the objectives of healthful living.

This is not quibbling with words. It is a difference which suggests that health teaching must be focused on *providing situations* conducive to learn-

ing. It is a difference which indicates that our emphases in a program of health teaching must be changed from attention to what is being done by the teacher to what is happening in the learner. Thus, the techniques for teaching health take their proper place as aids to facilitate learning, and their use will depend upon the degree to which they help a person in a given stage of the learning process. Some teaching aids impart authentic information; others develop motivations and desires to take action; still others enable the learner to participate in activities which bring satisfaction in their doing.

The armamentarium of the health worker, then, be it a scientific lecture, film, exhibit, pamphlet, conference, demonstration, discussion technique, or group planning activity, needs to be assessed as to its appropriateness in contributing to the development of a person in the stage of learning at which he finds himself.

If a "program of health education" means a program of providing situations for people in which, as learners, they "educate" themselves, then we have no quarrel with such a program. If on the other hand a "program of health education" implies that the health worker using his bag of techniques is doing the educating we must seriously disagree.

## W. W. PETER, M.D., DR.P.H., F.A.P.H.A.

*Director, Training Division, Institute of Inter-American Affairs,  
Washington, D. C.*

1. Health education is a means of persuading people to understand, accept, and apply that which will help them to live joyously, and productively, and to keep free from mental and physical deterrents for as long as possible.

2. Under an absolute dictatorship, volunteer health education would have no place whatsoever. To improve individual and community health, perhaps for military purposes, the dictator would merely issue commands to his subjects to do certain things, or else. This fantastic possibility has not yet been dramatized by some frustrated health educator discouraged over having to live in a democracy whose citizens pay him too little mind and consequently live incompletely and die prematurely. Regimentation may have its good points.

3. But for free people, obliged to make many decisions daily to do or not to do this or that, to shape their mode of living, education in health is one of many things to which they must be exposed, whether it takes or not. That is where the trained and skillful health educator comes in to provide subject matter and some sugar coating, an overall plan and individual incentive, plus occasional arresting devices to compete with other claimants for attention in a bewildering world.

4. When health education is aimed at the individual, it is with the hope that he will manifest his enlightenment by better personal health habits. When directed at communities a majority acceptance is sufficient. The unresponsive minority otherwise engaged will enjoy the new benefits anyway.

5. Health determining factors vary. In some parts of the world health education must begin with sanitation of the environment. Elsewhere, these problems have been replaced by others, including the distribution of medical care, the degenerative diseases, and problems affecting an aging population. Health education is not static. It is ancillary to scientific progress. Every now and then discoveries are made of important health significance. Potential beneficiaries must depend upon health educators in various guises to serve as transmitters between producers and consumers. Thus, health education is an important means of helping people achieve a higher level of living.

6. The real test of health education work is not how attractive are the hook and worm, but how many fish are caught; not how varied or fancy the sales techniques, but how many people bought the product for themselves, and are so satisfied that they tell their neighbors the good news.

## CHARLES C. WILSON, M.D., F.A.P.H.A.

*Professor of Education and Public Health, Yale University, New Haven, Conn.*

Health education is an instrument which society uses to help assure individuals the benefits of modern medicine and public health. It helps them to understand themselves as living or-

ganisms and to become familiar with the various influences that affect health. It acquaints them with community resources for protecting and improving health, and helps them to solve individ-

ual and community health problems. Health education, therefore, is a means of securing widespread understanding and utilization of modern knowledge concerning health promotion and disease prevention.

What Is Health Education? may be answered by the following definition: Health education is the process of providing experiences for children and adults for the purpose of favorably influencing their knowledge, attitudes, and practices relating to health. Elaboration on the meaning and significance of certain words in this definition will help to clarify the nature and scope of health education as well as the total implications of the definition.

The word "process" indicates that health education doesn't just happen; it is carefully planned and efficiently conducted, with appropriate consideration of ultimate goals and of the best means for reaching them. Although unplanned experiences contribute to an individual's education relating to health, the teacher or health educator is concerned with supplementing incidental experiences with those that are carefully selected for their known value in attaining specific goals.

"Experiences" is used in keeping with present-day concepts of how individuals learn. The health educator and teacher are concerned with providing numerous and varied experiences and their work involves using all the techniques in the educator's armamentarium: reading and discussion, projects and re-

citations, audio-visual aids and problem solving, lectures and conferences, visitations and debates. The experience may take place in a classroom or conference, in the hospital or physician's office, in a committee meeting, or at home. Regardless of the technique used or the place where the experience occurs, the health educator is aware that interest and active participation facilitate learning. The student, whether child or adult, is given opportunities to share in planning and to "learn by doing."

The words "knowledge, attitudes, and practices" indicate three aspects of learning, each of which is important in health education. We are concerned with what individuals know, how they feel, and what they do. Influencing a person's health interests or attitudes, or changing his behavior, are just as important as helping him to secure understanding. Actually, knowing, feeling and doing are so closely interrelated in the learning process that it is almost impossible to separate them, except for discussion purposes.

Obviously, the word "health" refers to a condition of the total individual, and has physical, mental, emotional, and social components. Furthermore, health is considered a resultant of inherited endowments and of such environmental factors as personal and community health practices. Important goals of health education are to help each individual develop desirable personal health practices and to share in community health efforts.

# Health Goals for Housing\*

C.-E. A. WINSLOW, DR.P.H., F.A.P.H.A., *Chairman*

*Committee on the Hygiene of Housing, American Public Health Association,  
New Haven, Conn.*

## OBJECTIVES OF THE COMMITTEE

THE Committee on the Hygiene of Housing was established in 1937, at the request of the Housing Commission of the Health Organization of the League of Nations, and as one of the national committees corresponding with that Commission. Since that time it has served as the active housing arm of the American Public Health Association, and as a national clearing agency on health aspects of housing.

The committee's work is addressed to basic problems having practical significance for housing, nationally and internationally. Its aims have in the main been twofold: (a) to develop technical and administrative tools for housing improvement: standards for housing based on public health knowledge, means for evaluating departures from such standards, and legal and administrative procedures for the regulation and improvement of housing; (b) to enlist the interest of housers in health and of health workers in housing, and to promote coöperation between these workers and related groups in a comprehensive attack on the housing problem.

The members of the committee include representatives of public health and housing administration, city planning, sanitary engineering, architecture and construction, heating and ventilating research, sociology, home economics, research in statistical methods, and the law.

Programs are laid down and general policies shaped at annual or semiannual meetings of the full committee. Investigations are carried out by research subcommittees (including coöpted expert members from pertinent special fields), which conduct interim work-meetings as needed and are serviced by the committee's full-time staff.

The first adventure of the committee was the preparation of a report on "Basic Principles of Healthful Housing" (first published in 1938, with a slightly revised version in 1939). This report outlined in specific form thirty essential health needs which must be met if the dwelling is to provide a healthful environment for the family of the future. These are grouped under the four headings of Fundamental Physiological Needs, Fundamental Psychological Needs, Protection Against Contagion and Protection Against Accidents. This pioneer effort has been received with gratifying interest and has been generally accepted by authorities in many countries. It has recently been chosen by the American Institute of Planners as one of two American documents to be translated into Spanish, Russian, and other languages.

The committee next set about the expression of these Basic Principles in more concrete terms of performance through which the aims of adequate housing could be implemented by health officers and by public bodies and private groups and individuals interested in one

\* Approved by the Committee, March 8, 1947.

way or another in the erection of future dwellings. Many collateral studies were carried out, some of which are described in a book, *Housing for Health*, in 1941, embodying the results of a conference called by the Milbank Memorial Fund. The major lines of work undertaken will be discussed in succeeding paragraphs of the present report. After ten years of the life of the committee, it seems timely to review our accomplishments and to chart our general course for the future.

This is particularly important, since the committee seems to stand today on the threshold of greater opportunity. Thanks to the continued generous support of the Milbank Memorial Fund and to the contributions made from time to time by other foundations and agencies, we have kept the ship afloat, although sometimes with anxious and difficult moments. The loyal support of the headquarters office of the American Public Health Association, the widespread and enthusiastic support of our efforts from the U. S. Public Health Service, city and state health officials, housers and planners, and the dawning interest in our work in other countries, gives us confidence that this work will continue—and on an expanded scale.

The program presented below embodies five major lines of activity, all more or less clearly visualized in earlier memoranda, but presenting, in greater or less degree, immediate challenges for the future. These objectives must be considered somewhat in detail. In many cases a present or clearly impending pressure on the committee from outside sources, growing out of recognition of past achievements, has been brought to our attention.

### *I. Measuring the Quality of Existing Housing*

A central question in any program of housing improvement is: How bad and how extensive are the conditions to be

remedied? The health deficiencies and general quality of housing in slum areas must be measured objectively if enforcement policies of local health and building departments are to be intelligently shaped, and if rehousing programs are to meet real needs. At the time of the committee's inception no adequate method for such measurement existed. The survey procedure most widely used by housing authorities in judging the need for public housing has been the Real Property Inventory, a method of very limited usefulness because of the few factors covered and dependence on subjective schedule items. Inspection data from local health and building departments have usually been even less helpful to the housing agencies, because problem areas have not been systematically covered, because of unclear inspection forms, lack of any qualitative summation of the findings, and other factors.

In response to requests from health officials and housing authorities, the committee has concentrated a major part of its effort in the past several years on developing an inspection and appraisal method to meet this need of both enforcement and reconstruction agencies.

The appraisal method provides for observing a sufficient number of objective factors in housing quality to permit conclusive judgment as to the healthful adequacy of individual dwellings and of entire problem areas. The measurement of housing quality is expressed through a system of scores which has been thoroughly tested and has gained the approval of competent statisticians in the field of scale measurement. The results are finally expressed in the form of quantitative penalty scores and of specific basic deficiencies. The latter can be immediately used by the health department or other regulating authorities for rehabilitation orders or condemnation. The penalty scores, when

plotted on a map, provide the planner and the housing authority, as well as the health officer, with invaluable data for long-range policies.

The appraisal procedure was prepared with the greatest care and with the counsel of the best available experts. It was tested and retested on a practical scale and finally embodied in three monographs: one on the general philosophies and procedures involved, one on the appraisal of the dwelling unit itself, and one on the appraisal of the environment—a wholly new contribution to the housing problem. The first of these three volumes was issued over a year ago, the second will be issued in the immediate future, and the third is complete in manuscript and only delayed by shortage of staff at the printers.

This part of our job is done; and the reception of the appraisal procedure has been more enthusiastic than we had dared to hope. It has been officially used in Brookline, Mass.; in various small semi-rural areas of Connecticut; in Los Angeles, Calif.; Milwaukee, Wis.; New Haven, Conn.; Philadelphia, Pa.; Portland, Me.; St. Louis, Mo.; and Washington, D. C.—as well as in Panama City, Republic of Panama. The studies at Los Angeles and Milwaukee have already been conducted for over a year.

In these cities the findings are being used as the basis for the coördinated administrative policy of official agencies. Philadelphia, after a preliminary trial, has embarked on large-scale use of the technique to guide its ambitious program of urban redevelopment. Wherever it has been really tested this appraisal method has won ardent converts; and the U. S. Public Health Service is making earnest efforts to promote its use throughout the country.

We have now an acceptable, and accepted, measuring stick for the substandardness of housing.

## II. *Establishment of Standards for Housing of the Future*

Our second problem, in a sense complementary to the first, was the formulation of broadly conceived but specific standards of performance for the new housing to be constructed in the years to come. We instituted this project in 1944 by the appointment of four subcommittees, to deal respectively with the Neighborhood as a suitable environment for the home, the Occupancy Standards involved in planning the dwelling, the Construction of the home and its Equipment. These subcommittees, under the chairmanship, respectively, of Frederick J. Adams, James Ford (succeeded by Clarence W. Farrier), Henry S. Churchill and Helen W. Atwater (succeeded by Mary Rokahr) have attacked their problems effectively. We have recently decided to concentrate the last two of these reports into one so that the final series will include three volumes, as follows:

1. The Neighborhood Environment of the Home
2. Planning the Home for Occupancy
3. Construction and Equipment of the Home

In each of these three monographs it is hoped to formulate definite and specific performance standards with regards to neighborhood and site planning, planning of the home itself for occupancy and construction, and equipment of the home. "Standard" requirements will be suggested which should govern all new construction; and, where appropriate, a "lowest tolerable minimum" (failure to meet which would justify legal action for rehhabilitation or condemnation) has been indicated; also, at times an "optimum," desirable where financial resources make it possible to exceed the "standard."

In the preparation of this series of monographs, we have been fortunate in the coöperation of the National Housing Agency, which during the past fall and

winter worked with us closely and intimately so that our joint conclusions will have assurance of official backing.

Volume I of this series, dealing with the Neighborhood Environment of the Home, was approved for publication at the March meeting of the committee. The preparation of the other two monographs is now our primary task and it is hoped that this task may be completed by the close of the calendar year. It is vital that the work be accomplished without delay, since so much of the home construction now under way is of so poor a quality as to constitute little more than an addition to our slum problem.

### III. *Strengthening and Clarification of Housing Regulation and Their Enforcement*

A third major project, envisaged in our earlier memoranda, was the study and improvement of practice in the field of housing regulation by health departments and other official bodies. In this field there is a considerable amount of valid precedent. Though out of date in some particulars, Veiller's Model Housing Law of 1920 (adopted in whole or part by several states and cities) is a landmark of constructive thinking and sound practice. In the two decades since Veiller, many kinds of specific regulation have been developed for particular local needs, and various devices for improving enforcement practice or clarifying administrative responsibility have been tried.

The total picture of housing regulation, however, remains chaotic. Laws or ordinances are developed in one place and slavishly copied in another, where conditions may be wholly different. Requirements for new dwelling construction are generally buried in building codes, where preoccupation with the structural requirements of many other types of buildings results in neglect of fundamental health requirements such

as protection of water supplies and sewage disposal, adequate spacing of buildings, reasonable room sizes, or even the requirement of basic heating and sanitary facilities.

In most communities the requirements for existing dwellings (maintenance of repair, permitted occupancy, services required in multiple dwellings, etc.) are both archaic and uncoded. Scattered through many ordinances and codes, they are hopelessly obscure as a basis for enforcement even where their provisions are reasonably in line with modern thinking.

From its earliest days, the committee has been repeatedly approached by local and state health officials and by the national housing and public health agencies for advice or assistance in framing or revising regulatory housing laws and ordinances, in order that these might reflect contemporary health criteria of housing adequacy.

In response to such requests the field of legislative control has been recognized as the third concentration area for the committee's investigative effort, and basic studies addressed to urgent practical problems in this field have been initiated.

It has seemed to the committee desirable to differentiate, in our initial approach, between Building Codes, designed to cover the erection of new structures, and Housing Codes, governing action with regard to rehabilitation or condemnation of existing dwellings. We recognize that some states have "Housing Codes" dealing with both new and old dwelling structures. On a local level, however, this combination rarely exists; and for the present discussion, we shall use the terms as defined above. In this sense, the Building Code normally deals with all structures, including dwellings, and is commonly enforced by a building department. The Housing Code, in the sense in which we have used the term, deals with occupied

dwelling and—in large measure—with conditions of dilapidation and occupancy. Yet the two fields are obviously closely related. In both instances, three different problems are basically involved:

1. What should be the basis, in administrative law, upon which such codes should be established and how specific should they be, that is, how far should authority on detail be delegated to the enforcing agency?
2. What specific body or bodies in a municipality should exercise the power of preparing such codes and enforcing them?
3. What should be the substantive content of such codes?

The subcommittee appointed to deal with this problem, under the leadership of Charles S. Ascher, has made substantial contributions in several brief reports on the first of these questions. In an address on "The Regulation of Housing," delivered at the Inservice Training Course in Housing at Ann Arbor last August, he presented an admirable exposition of the subject and demonstrated his conviction that housing regulation should be accomplished—not by expansion of the general powers of the health department to control nuisances under the common law, and not by invoking the right of eminent domain, but by the adoption of a single uniform code dealing with all aspects of health and safety under the police powers of the community. The substance of Mr. Ascher's article, if presented in more formal terms, would be an excellent report for our committee, and we hope that it may be developed in such fashion during the next few months. It is hoped that the report may point out the extent to which it should be possible to reduce both Building and Housing Codes to relatively simple performance standards, delegating to the enforcing authorities the power to determine the degree to which particular conditions meet such broad performance standards.

The minuteness of the specifications

in many present codes is nothing less than fantastic, and works incalculable harm by freezing someone's haphazard judgment of the moment into shackles which may impede sound engineering progress and increase construction costs for decades to come.

A second vital point relating to administrative machinery for enforcement is indirectly answered by Mr. Ascher's subcommittee in the recommendation that the Housing Code be framed by a committee to be set up in a given community to represent various agencies involved in housing supervision. Professor Spencer Parratt, in a valuable recent paper on "Administrative-Legal Methodologies in Elimination of Substandard Housing,"\* appears to favor transferring all such powers to a separate housing administration. The health department, however, has certain fundamental day-by-day responsibilities with regard to health which can scarcely be abrogated. It is fundamentally bad administration to have two or more sets of inspectors routinely visiting the same premises for closely allied purposes. It would seem wiser, instead of introducing a sixth new agency in the regulatory field, to suggest a procedure by which the health department, the building department, the fire department, the police department, and the zoning board would cooperate in framing both Building and Housing Codes. Special legislation might be desirable which would permit the issuance of jointly supported Building Codes and Housing Codes, but in any case the existing powers of health departments to draft housing regulations having the force of law should be preserved.

The Building Code might logically be enforced by the building department, which grants permits for all new structures, while the Housing Code might

\* *Law and Contemporary Problems: Housing*, School of Law, Duke University, Vol. XII, Winter, 1947, p. 110.



primarily be enforced by the health department (with the building and fire departments coöperating where desirable). In any case our committee should decide on a recommended policy—or alternative policies—and formulate its conclusions with a minimum of delay.

Finally, the third problem—that of the substantive content of a Housing Code—has not as yet been attacked effectively by our committee, although the appraisal procedure and the “minimum tolerable” conditions in our monographs on standards for future housing furnish much of the material needed for such a code.

Action in this field—and prompt action—seems to be of vital importance. It has therefore been decided to appoint a new Subcommittee on Substantive Content of a Housing Code. This subcommittee will be headed by Health Commissioner E. R. Krumbiegel of Milwaukee, and should include representatives of the fields of building inspection and fire protection. Our present Subcommittee on Housing Regulation should attempt to answer question 1 above. Both subcommittees should coöperate in answering question 2. The new subcommittee should deal with question 3.

In regard to questions 1 and 2, our subcommittees might properly deal with both Building and Housing Codes, but in approach to question 3 we believe that we should, first of all, approach the question of the substantive content of the Housing Code. There are three reasons for this order of approach. In the first place, Housing Codes frequently fall within the direct responsibility of our primary client, the health officer, while Building Codes do not. In the second place, Building Codes are fully crystallized in forms which are generally archaic and inadequate but supported by powerful vested interests and traditions, while Housing Codes are either wholly absent or still fluent and can

readily be improved. Finally, perhaps the best way to approach the citadel of the Building Code is to establish good Housing Codes and then develop the deficiencies of the Building Codes by demonstration of the inadequacies and unreasonablenesses of their requirements.

#### *IV. Promotion of Use of the Committee's Findings*

The first three objectives which have been outlined all deal with the development of standards, procedures, and policies which we hope may be applied by others. Without such application, they are merely pious aspirations on paper. Our committee, although primarily a research body, has recognized from the outset both an opportunity and a responsibility for promoting wider understanding and habits of coöperative attack among those agencies and professions whose functions impinge on the public health aspects of housing. Such understanding and attack have been promoted first by the varied composition of the committee, whose membership brings together expert technicians and administrators from a dozen branches of the housing and public health movements, and second by the selection of its projects and the character of its open meetings, at which even wider groups have been convened to coöperate in the committee's program or to review parallel developments from other sources. A considerable list could be adduced of the significant lines of investigation by other groups, or of wholly new kinds of inter-agency coöperation which are directly or indirectly traceable to this conscious emphasis of the committee.

Certain main lines of essential public relations are clearly indicated, as follows:

##### *A. Promotion of Use of the Appraisal Procedure:*

1. To stimulate official and professional interest in the practical signif-

icance of the appraisal method by obtaining early publication in appropriate journals of the comparative results (graphically presented, with simple text) of three to five of the studies now completed or in process (Milwaukee, Los Angeles, Philadelphia, St. Louis, perhaps Washington or New Haven).

2. To extend the machinery available for local installations of the technique by carrying through with the U. S. Public Health Service contemplated training of housing specialist personnel of its district offices.

3. To interpret accumulating experience with the technique (for the general benefit of users and for needed adaptations to regional or other problems) by maintaining an advisory relation to the U. S. Public Health Service.

4. To promote the use of the technique, internationally, with suitable modification, by rendering consulting service as desired by foreign agencies (a forthcoming Spanish publication of a study at Panama is expected to create demand in Latin America).

5. To encourage inclusion in the 1950 U. S. Housing Census of improved schedule items or tabulation practices developed for this technique, by resumption of coöperative arrangement with the Bureau of the Census, with appropriate test studies of proposed Census material.

6. To adapt the procedures to rural or other special types of housing, by coöperative studies with agencies desiring such adaptation.

#### *B. Promotion of Acceptance of our Monographs on Standard Housing by:*

1. Complete and prompt publication of our scheduled reports on Occupancy, Construction and Equipment standards.

2. Furthering the acceptance of such standards by the building industry, the real estate groups, groups interested in the financing of housing and various public bodies with responsibilities for

housing supervision, through brief and popular summaries for their professional meetings and publications.

3. Promoting consumer demand for proper standards in housing, through non-technical articles in popular magazines of national circulation.

#### *C. Strengthening and Clarifying Regulatory Housing Procedures by:*

1. Publishing as a committee document the housing regulation subcommittee's findings and recommendations as to administrative provisions in housing control.

2. Publishing, in combination, or in series with the above, a statement of the essential substantive provisions of housing regulation—a statement which will carry to the point of quantitative specifications in so far as possible. The steady flow to committee headquarters of inquiries in this field indicates its growing importance to health departments, and suggests the urgency of committee publication. Release before the end of 1947 of both statements noted above—even though one or both may be provisional—should be considered most desirable.

3. Stimulating adoption of regulations embodying the principles developed, through joint efforts with the U. S. Public Health Service, state health departments, and other means to be explored.

4. Interpreting experience under such regulations, as a basis for future improvement thereof, through subcommittee contacts with adopting localities or states; and publishing from time to time such interpretation and suggested improvements as experience may warrant.

#### *D. General Relations with the Public Health and Allied Profession:*

If we are to attain the goals in view it seems important:

1. To stimulate the assumption by

American health departments of their full responsibility in broad housing programs, by creation of a subcommittee charged with exploration of this problem. Such a group would presumably consider means of channelling the technical output of the committee to health departments, but would be concerned with other matters also. For instance, what training should be offered in public health schools to provide personnel for the housing functions of health departments?

2. To promote the effective participation of health departments in the housing programs, by using available machinery of the American Public Health Association (Committee on Administrative Practice, Engineering and Health Officers Sectional organizations, *American Journal of Public Health*) as a channel for the procedures developed by the committee.

3. To stimulate the development of housing machinery within the World Health Organization, and through it the development of other national committees on the hygiene of housing; by calling attention to international interest of health agencies in the work and output of our committee, and by other means to be explored.

4. To strengthen interprofessional coöperation in the fields of housing, public health, city planning, and related academic disciplines; by systematic exchange of our publications with leading national and international bodies in these fields and by participation in their professional conferences.

#### V. Research

"Research" is a term not easy to define. Our reports, dating back to the *Basic Principles of Healthful Housing* have all been founded on research, and research not confined to the library but extending to important studies of air conditioning, illumination, and sound control in the field. Our appraisal pro-

cedure rests firmly on the basis of exhaustive field research.

It seems likely, however, that fundamental investigation must play a larger part in our future program. The preparation of the monographs on standards has revealed many serious gaps in knowledge which remain to be filled. Below is a list of certain specific topics which have been brought forcibly to our attention.

1. Determination of the most desirable levels of illumination for the performance of various household tasks, to resolve the present difference of opinion between psychologists and illuminating engineers in regard to this problem, presumably in coöperation with the Illuminating Engineering Society and other bodies.

2. A further definition of the noise levels compatible with human health and comfort (to perfect existing standards which have little substantial basis); and a study of the quality and effect of various outdoor noises and of the influence of site planning and natural barriers in reducing such noises.

3. A study of the influence of space allowances and space organization in the dwelling upon household operation, psychological reactions and emotional tensions, perhaps in coöperation with other organizations, including the National Institute of Mental Health.

4. A study of the influence of residential density upon the load on community facilities and the cost of such facilities, in coöperation with housing management and various specialized groups concerned.

5. A laboratory analysis of the basic factors in floor construction affecting safety and fatigue. This would involve the development of instruments for measuring both resistance and resiliency of flooring materials and psychological study of their effects upon the human organism.

6. Development of adequate techniques for the evaluation of the influence of good housing upon physical, emotional, and social health. A careful study of this problem is now being carried on by a special joint committee appointed by the American Public Health Association and the National Association of Housing Officials.

These are only a few of many suggestions which might be made. It seems desirable that the committee, in this field, should undertake:

1. To appoint a special subcommittee on housing research to formulate a series of the more important problems which call for solution, and to suggest the general lines along which such problems might be solved.

2. To foster needed further research in the field of housing standards, by systematic statement of those problems on which present knowledge is inadequate; with special reference to problems within the competence of the U. S. Public Health Service, American Public Health Association, state health departments, schools of public health or other health agencies.

3. To encourage a rational distribution of housing research effort, by exchange of information with other national bodies concerned with housing, public health, planning or other allied research (Social Science Research Council; U. S. Public Health Service; University of Wisconsin Conference on Housing Research; National Association of Housing Officials; technical divisions of National Housing Agency, Federal Public Housing Authority, Federal Housing Administration; National Research Council; Bureau of Standards, etc.; also similar bodies abroad).

4. To prosecute such studies as may be appropriate to the abilities and scale of the committee, by assignment of subcommittees and staff to selected investigations.

It is fully realized that such a program as that outlined will seem Utopian. Yet "a man's reach should exceed his grasp"; and the present progress of the committee's work would have seemed Utopian when the committee was established ten years ago.

We have, first of all, to apply our limited resources to the completion of our two unfinished jobs, the preparation and publication of the standards monographs and the development of official recommendations with regard to the methodology and substantive content of regulatory legislation.

We cannot promote policies we have not clearly formulated and adopted. Yet the formulation of policies is of limited value unless they are applied. If the general lines of activity outlined above seem sound to the committee, additional available funds will automatically determine their practicability.

But funds are rarely available without a bold and far-reaching program.

#### PRINCIPAL COMMITTEE PUBLICATIONS

##### Committee on the Hygiene of Housing

1. Basic Principles of Health Housing Committee report. *A.J.P.H.*, Mar., 1938. 2nd ed. issued May, 1939, as Reprint.
2. Britten, Rollo H. Housing and Health. *A.J.P.H.* 28, 8:957-960 (Aug.), 1938.
3. Connelly, Joel I. Plumbing in Low Cost Housing. *A.J.P.H.*, 28, 8:954-956 (Aug.), 1938.
4. Whittaker, H. A. The Sanitation of Isolated Dwellings. *Pub. Health Rep.*, June 3, 1938, pp. 902-909.
5. Ives, James E. Lighting for Low-cost Housing. *Pub. Health Rep.*, June 3, 1938, pp. 805-901. Revised 1940.
6. Winslow, C.-E. A. Opportunities and Responsibilities of the Health Officer in Connection with the Federal Housing Acts. *A.J.P.H.*, 28, 11:1269-1276 (Nov.), 1938.
7. *Housing for Health*. Collected papers. Lancaster, Pa.: Science Press Printing Co., 1941.
  - Health and Housing. C.-E. A. Winslow.
  - Enforcement and Subsidy in the Control of Slums. L. M. Graves, and Alfred H. Fletcher.
  - An Experiment in Housing Survey and Inspection Procedures for Health Departments. George C. Ruhland.
  - Housing Codes. Morton G. Lloyd.
  - Health Centers and Health Services in Housing Projects. John C. Leukhardt.
  - Heating, Lighting, and Noise Conditions in Recent Housing Projects. Allan A. Twichell.
  - Heating and Ventilation of the Home. C.-E. A. Winslow.
  - New Possibilities in Low-cost Home Construction. Robert L. Davison.
  - Planning for Recreation. Frederick J. Adams.
  - Family Life as the Basis for Home Planning. Svend H. Riemer.
  - Social Effects of Good Housing. F. Stuart Chapin.
  - Certain Characteristics of Urban Housing and Their Relation to Illness and Accidents. Rollo H. Britten, et al.
  - Appendix A: Basic Principles of Healthful Housing.
  - Appendix B: Organization of Research Subcommittees (as of 1940).
8. Safety in the Home. Manual prepared by Subcommittee on Home Safety. *Pub. Health Nurs.*, Aug., 1941.
9. Problems of Water Supply and Sewage Disposal in the Selection of Housing Sites. Report of Subcommittee on Home Sanitation. *Am. City*, Oct., 1941.
10. Britten, Rollo H. New Light on the Relation of Housing to Health. *A.J.P.H.*, 32, 2:193-199 (Feb.), 1942.
11. Essentials of Space Planning and Space Organization in Dwelling Units. Report of Subcommittee on Standards of Occupancy, Mar., 1942 (out of print).
12. Twichell, Allan A., and Solow, Anatole. A Technique for the Appraisal of Housing in Urban Problem Areas from the Viewpoint of Public Health. *Planners' J.*, July-Sept., 1942.
13. The Improvement of Local Housing Regulation under the Law. Report of the Subcommittee on Housing Regulation. C.-E. A. Winslow, Dr.P.H., Chairman. *A.J.P.H.*, 32, 11:1263-1277 (Nov.), 1942.

14. Twichell, Allan A. Measuring Substandard Housing Conditions. *Public Management*, Feb., 1943.
15. A New Method for Measuring the Quality of Urban Housing. Report of the Committee on the Hygiene of Housing. C.-E. A. Winslow, Dr.P.H., *Chairman*. *A.J.P.H.*, 33, 6:729-740 (June), 1943.
16. An Appraisal Method for Measuring the Quality of Housing: A Yardstick for Health Officers, Housing Officials and Planners. American Public Health Association, New York.
- Part I. Nature and Uses of the Method. 1945.
- Part II. Appraisal of Dwelling Conditions. 1946.
- Part III. Appraisal of Neighborhood Environment. In preparation.
17. Standards for Healthful Housing.
  - The Neighborhood Environment of the Home. In preparation.
  - Planning the Home for Occupancy. In preparation.
  - Construction and Equipment of the Home. In preparation.

*Committee Membership: 1947*

C.-E. A. WINSLOW, DR.P.H., *Chairman*  
 FREDERICK J. ADAMS  
 CHARLES S. ASCHER  
 ROLLO H. BRITTEN  
 F. STUART CHAPIN, PH.D.  
 HENRY S. CHURCHILL  
 ROBERT L. DAVISON  
 CLARENCE W. FARRIER  
 ALFRED H. FLETCHER  
 L. M. GRAVES, M.D.  
 E. R. KRUMBIEGEL, M.D.  
 BLEECKER MARQUETTE  
 M. ALLEN POND

F. CARLYLE ROBERTS, JR.  
 MARY ROKAHR  
 ABNER D. SILVERMAN  
 HOWARD P. VERMILYA  
 H. A. WHITTAKER  
 HUNTINGTON WILLIAMS, M.D.  
 SIDNEY J. WILLIAMS  
 HENRY WRIGHT

*Staff:*

ALLAN A. TWICHELL, *Technical Secretary*  
 ANATOLE A. SOLOW, *Research Associate*  
 EMIL A. TIBONI, *Field Secretary*  
 ROSE OLANIK, *Assistant Secretary*

# Control of Dengue in Hawaii

CHARLES L. WILBAR, JR., M.D., F.A.P.H.A.

*President, Board of Health, Territory of Hawaii, Honolulu, T.H.*

DENGUE fever appeared in the Territory of Hawaii in July, 1943, for the first time since 1912, and soon after its appearance reached epidemic proportions. Usually when dengue is introduced into a non-immunized community, particularly a community where mosquitoes live and breed all the year around, a majority of the population contracts the disease within a short time. However, only 1,498 cases of dengue occurred during this epidemic in the Territory, out of a population of approximately 500,000 persons. There is, consequently, good cause to believe that the preventive measures taken during this outbreak of dengue may have been responsible for controlling its incidence. All but two of these cases occurred in the city of Honolulu, the population of which is approximately 250,000.

After the epidemic phase, dengue continued to occur sporadically in the Territory. This paper deals with the epidemiological aspects of dengue control in the Territory both during the epidemic period and during the endemic period to date. Most of the dengue control measures have had to do with efforts directed at the elimination of *Aedes* mosquito, the vector of the disease, which breeds in the Territory throughout the year, although it is believed that efforts to obtain early diagnosis and proper segregation of persons so that mosquitoes could not bite them played a part in the successful control of the disease.

At the onset of the epidemic, the Honolulu Chamber of Commerce and the U. S. Public Health Service con-

tributed funds toward dengue control, and the Army was soon aiding in the control program by assigning considerable personnel and equipment to control work. At the request of the Territorial health department, the Public Health Service immediately flew to Hawaii an entomologist (Dr. Robert L. Usinger) and a sanitary engineer (Wesley E. Gilbertson) from the Atlanta office of its Malaria Control in War Areas unit. In March of 1944, Dr. Usinger reported on the entomological phases of the dengue epidemic in Honolulu<sup>1</sup> and in March of 1945 there was printed in the *American Journal of Public Health* Mr. Gilbertson's report on the sanitary aspects of the control of this epidemic.<sup>2</sup>

## EPIDEMIOLOGICAL DATA

The epidemic phase of dengue ran its course largely during the fiscal year beginning July 1, 1943. The first two cases reported to the Board of Health had their onset of symptoms on July 24, 1943. Information concerning the 1,498 cases which developed in Honolulu during that year has been subjected to statistical analysis.

Although during the war years there were several times as many males residing in the Territory as there were females, 58 per cent of the cases of dengue occurred in females, and 42 per cent in males. The higher incidence of breeding of the daytime *Aedes* mosquito in and about residences compared to the business district may be the factor responsible for the preponderance of cases among females.

months, followed by a gradual decline throughout the following six months. Dengue has continued to occur sporadically in the Territory since then, although no cases have been reported to the health department since July, 1945.

Figure 3 indicates the weekly incidence of dengue along with the *Aedes* breeding index and the rainfall in inches during the epidemic period. Table 1 portrays numerically the weekly incidence of the disease during that period.

#### CONTROL MEASURES

Upon the outbreak of dengue the health department, with the cooperation of the Army authorities, the Navy

authorities, the U. S. Public Health Service, the Public Health Committee of the Chamber of Commerce of Honolulu, the Office of Civilian Defense, the government of the City and County of Honolulu, the Department of Public Instruction, and certain other governmental and private agencies, inaugurated a concentrated educational and publicity program to keep the civilian and military population of the Territory well informed as to the possible seriousness of an epidemic of dengue and how to prevent its spread. The control of the *Aedes* mosquito was stressed, both as to methods of destroying the adult mosquito and of preventing the breeding of this daytime vector.

TABLE 1

*Dengue Cases Occurring in the Territory of Hawaii during the Epidemic from July, 1943, to June, 1944, by Week of Onset*

<i>Date of Onset</i>	<i>No. of Cases</i>	<i>Date of Onset</i>	<i>No. of Cases</i>
July, 1943		January, 1944	
no date	3	2-8	17
18-24	2	9-15	5
25-31	10	16-22	4
		23-29	21
		30-2/5	11
August		February	
1-7	26	6-12	14
8-14	40	13-19	5
15-21	47	20-26	7
22-28	42	27-3/4	4
29-9/4	33		
September		March	
5-11	40	5-11	8
12-18	31	12-18	2
19-25	44	19-25	4
26-10/2	77	26-4/1	13
October		April	
3-9	116	2-8	7
10-16	132	9-15	3
17-23	143	16-22	3
24-30	107	23-29	5
31-11/6	122	30-5/6	5
November		May	
7-13	92	7-13	2
14-20	66	14-20	2
21-27	51	21-27	0
28-12/4	43	28-6/3	1
December		June	
5-11	31	4-10	0
12-18	33	11-17	0
19-25	13	18-24	0
26-1/1	10	25-30	1
Total Number of Cases			0

This educational publicity took the form of (1) daily newspaper articles, (2) daily radio news broadcasts, (3) six 75 word spot announcements per day over Honolulu's two radio stations during the first month of the epidemic, (4) radio spot announcements in the Filipino language, (5) distribution of 30,000 multigraphed sheets on mosquito control, (6) a house-to-house educational canvass by the city's OCD wardens to search for mosquito breeding areas and to inform individuals as to mosquito control procedures, (7) special 15 minute radio talks by health department personnel on the subject of dengue, (8) talks by health department staff to various community clubs, (9) quarter-page advertisements on mosquito control in both Honolulu daily newspapers, and (10) publication and distribution of a leaflet in English, Filipino, Chinese, Korean, and Japanese.

The physicians on Oahu were requested by the president of the Board of Health by circular letter, as well as verbally at the regular monthly meeting of the Honolulu County Medical Society, to report suspected cases of dengue immediately upon discovery to the Board of Health.

In each instance, when the communicable disease bureau of the health department was informed of such a case, the bureau arranged to have a public health nurse and a mosquito inspector immediately visit the home of the suspect, look for breeding places inside that home and in the areas surrounding it, destroy such breeding places wherever found, thoroughly spray the home of the suspect with pyrethrum insecticide, spray the homes surrounding that of the patient with insecticide, and instruct the persons in the vicinity as to mosquito control.



*Honolulu Advertiser Photo*

FIGURE 4—Outdoor spraying with pyrethrum-base spray for adult mosquito destruction. Standard Army Chemical Warfare Sprayer being used; also utilized, with excellent results, were Bean Tommy Gun Sprayers with  $1/32$ " orifice.



The Army loaned the health department a number of mosquito bed nets and, upon the visit of the public health nurse to the home of a suspect, she placed such a bed net over the sick person and instructed him how to use the bed net properly. This net was kept over the patient during the first four days of his illness, which is the period during which a mosquito can obtain the disease organisms from a dengue patient. The public health nurse also filled out the first part of an epidemiological report form, instructed the household in which the patient lived concerning precautionary measures, and helped to see that he obtained satisfactory medical and nursing care.

In the section of Waikiki where the outbreak originated, the following special precautions were taken: (1) the area was placed off-limits to all Army and Navy personnel who did not live or have official business in the area, and civilians were urged to stay out of the area in the daytime unless they had urgent business there; (2) mosquito control inspectors thoroughly searched the area for mosquito breeding places and eradicated those found; (3) with the aid of Army trucks containing high-pressure spraying apparatus, the whole area was clouded with pyrethrum insecticide under the direction of the mosquito control inspectors (Figure 4); (4) inspectors gave individuals in each household a mimeographed sheet of instructions concerning mosquito control, and verbally instructed persons in the household at the time of distributing the sheets; (5) personnel from the Office of Civilian Defense carefully checked all bomb shelters for mosquito breeding, destroyed the breeding places when present and thoroughly sprayed all such shelters with insecticide; (6) the Hawaiian Electric Company, the Mutual Telephone Company, and the Board of Water Supply checked man-holes and other installations in this

area for mosquito breeding places and stopped such breeding whenever it was found.

The Public Health Committee of the Chamber of Commerce of Honolulu, upon request at the onset of the disease, immediately made available funds to employ 24 additional mosquito control men to work under an employee on their pay roll who had been doing mosquito control work for a number of years and to work directly under the supervision of the bureau of sanitation of the Board of Health. Five soldiers trained in mosquito control were also loaned to the health department to work directly under the bureau of sanitation, and certain Army vehicles were assigned to aid in the control program. The Office of Civilian Defense loaned the health department two trucks for mosquito control work.

At the instigation of the health department, the Hawaiian Airlines agreed to spray thoroughly with insecticide the airplanes leaving Honolulu for other islands. The Army and Navy authorities immediately took action to see that military planes leaving the island of Oahu (on which Honolulu is located) were also sprayed in a like manner.

At the request of the health department the War Shipping Administration asked the masters of all interisland ships to look for mosquito breeding places before the ships left Honolulu and to spray thoroughly with insecticide the living quarters in the ships before the vessels left the port of Honolulu. The Army Transport Service issued similar instructions for its interisland ships and the Navy also took similar precautions.

The Army, Navy, and U. S. Public Health Service continued to emphasize the program which had already been in effect of thoroughly spraying with insecticide each airplane arriving in the Territory of Hawaii before the passengers left the plane, for the purpose of preventing the importation of any fur-

ther disease-bearing mosquitoes into the Territory. These organizations also sent quarantine officers aboard all incoming ships to look for persons with infectious diseases, including dengue. If any such persons were found they were immediately placed under quarantine.

The chief quarantine officer of the Public Health Service in the Territory arranged to have his personnel supervise a search for mosquitoes and mosquito breeding places on all ships leaving Hawaii for the mainland.

At the request of the Army, mosquito inspectors working for the Board of Health accompanied groups of soldiers in searching for mosquito breeding places for  $\frac{1}{4}$  mile radius around each Army post in the city of Honolulu. Besides restricting the Waikiki area, the Army restricted areas of a radius of 800 feet around each case of dengue in the city.

The two U. S. Public Health Service officers, arriving within a week of the reporting of the first case of dengue, were empowered to expend Public Health Service funds, under the appropriation for Malaria Control in War Areas, for hiring additional mosquito control personnel and purchasing additional mosquito control equipment.

To each of the county health officers on islands other than Oahu were sent detailed instructions regarding inauguration of all possible mosquito control measures on those islands, which were immediately put into effect.

A program for the clean-up of dumps, dumping areas, and vacant lots in order to destroy probable mosquito breeding places was inaugurated by the health department.

Since the public schools were about to open, the president of the Board of Health was invited to meet with the Commissioners of Public Instruction to offer suggestions for the school department's participation in the control program. His requests were put into effect

by the commission, as follows: (1) Before the opening of the schools careful mosquito control activities were inaugurated in and about the school buildings. (2) Methods of control and spread of dengue were emphasized in classroom teaching when the schools opened. (3) The schools were used as a means of disseminating to the homes information on the prevention of the spread of the disease.

All key persons in the health department intimately concerned with dengue control met twice a week along with Army and Navy representatives to keep each other informed as to the details of what was being done to control the epidemic and to formulate plans for new action.

The engineer of the Public Health Service who was assigned to the health department was placed in charge of the division of mosquito control of the bureau of sanitation. By the middle of September, there were 103 men working in this division, employed by the Chamber of Commerce of Honolulu, the U. S. Army, and the U. S. Public Health Service. Each of the inspectors was provided with a kit, consisting of mirrors and flashlights to find breeding places of larvae, three types of larvicide for control work, educational pamphlets for distribution to householders, and report sheets.

The entire city of Honolulu was divided into 94 control zones, and an inspector was assigned to each zone. They were grouped into cadres of 6 to 11 men each, under 12 foremen. Three district offices were located in the city at the main health building and at the two major health centers of the health department. Inspectional activities were carried out on a cycle of not less than 10 days. A total of 13 vehicles were in use, provided by the health department, the Army, and the Office of Civilian Defense. An in-service training program for the newly employed

inspectors was in continuous operation. One hundred thousand copies of educational pamphlets on mosquito control were printed and distributed by volunteer groups to persons living in the rural areas of Oahu and on the other islands.

By September 13, 1943, acting in accordance with epidemiological and entomological data, the military authorities lifted the restriction on the Waikiki area. By that time, the outbreak had spread to a number of other areas in the city and was definitely on the wane in the Waikiki district.

A second major concentration of dengue cases appeared in a congested part of the city known as the Kakaako District. The first cases were reported from a large laundry located there. Soon so many cases were present that the Army put this district out of bounds to its personnel. By the end of October, when there were still many cases in the Kakaako District, another major focus arose in the congested area near River Street, which was in turn placed out of bounds by the Army for their personnel. This proved to be the last major focus in the Territory, and it never reached the incidence that was attained in the Waikiki and Kakaako areas. By the end of the year Army restrictions had been lifted from all areas.

Only two individuals developed dengue outside of the City and County of Honolulu. These cases occurred on the island of Kauai in December, 1943. The first person to develop this disease was a resident of Kauai who had been visiting in Honolulu and while there had lived in a house where another case of dengue had developed. After returning to his home on Kauai, this man developed typical symptoms of dengue. A period of  $14\frac{1}{2}$  days had elapsed from the date of his departure from Honolulu until the onset of his sickness on Kauai. Owing to the conditions under which his disease developed, it can be stated that his incubation period was at least

$14\frac{1}{2}$  days, an unusually long incubation period for this disease. Ten days later another man living in the same house on Kauai developed dengue. From the time of the diagnosis of the first case on Kauai all precautions that were being observed in Honolulu were taken in the plantation village where this man lived, including covering the patient with a mosquito net, spraying the interior of the house where the patient lived and the exteriors of all buildings within a 500 foot radius of that house, and frequent inspections to eliminate mosquito breeding. No further cases have been reported from the island of Kauai.

Following the battle of Saipan the 5th Marine Division was sent to the island of Hawaii for a rest period. Upon arrival on Hawaii there were 26 marines ill with dengue. However, all of the individuals had been sick for at least 4 days, so that the period during which they could infect mosquitoes was passed. All individuals were isolated at the Marine Camp in an area remote from civilian population. Inspection of the area revealed no *Aedes* mosquitoes either of the *albopictus* or *aegypti* variety. No further cases of dengue developed among these marines nor did any cases develop among local inhabitants of the island of Hawaii.

During the early part of 1944 more and more personnel were assigned to the health department for mosquito control activities from the Army and from the U. S. Public Health Service, particularly from the former. The peak in the number of persons working on mosquito control in the Territory occurred in March, 1944, when 398 individuals were working under the health department on this activity. One hundred and ninety-nine of these were assigned to mosquito control activities in the city of Honolulu. With additional personnel the mosquito control program was extended to rural areas on the island

of Oahu and then to the other major islands of Hawaii, Maui, and Kauai. The breeding index of the *Aedes* mosquito, i.e., the number of premises found breeding this mosquito per hundred premises examined, was 10 per cent in the city of Honolulu at the outbreak of dengue, as determined by the health department's inspectional force. Concentrated efforts directed at mosquito control reduced this breeding index very quickly. By August 31, 1943, the index was 5.7. By September 30 it had dropped to 1.7. It remained a little over or below 1 for the rest of the year following the outbreak of the disease except for March, 1944, which was a particularly wet month, when it showed a rise to 3.5. Reductions in breeding indices on other islands and in rural Oahu were also accomplished by mosquito control activities, but not quite to the remarkable degree of reduction which took place in Honolulu, where nearly all of the cases of dengue occurred and therefore where the major continued concentrated mosquito control activities have been in effect.

Some control activities aimed at reducing the incidence of the night-flying, singing *Culex* mosquito were incidentally inaugurated under the mosquito control program for fighting dengue. While the *Culex* does not carry dengue and is not considered a potential spreader of disease in Hawaii, it is a considerable nuisance. Consequently, when *Culex* were found to be breeding in premises visited, measures were taken to prevent this breeding and householders were instructed as to control methods against this species. The *Culex quinquefasciatus*, the type found in Hawaii, tends to breed in large areas of water, such as polluted ponds, streams, and swamps, and is not therefore a domestic type of mosquito such as the *Aedes*, which breeds in and around houses in the small quantities of standing water often found in tin cans, bottles, and certain types

of plants. In controlling the *Culex*, swamps and streams have been sprayed with larvicide and stocked with mosquito fish, particularly with *Gambusia minnows*. Some streams have been cleared and a few swamps drained. Considerable reduction in the breeding index of the *Culex* mosquito was obtained with a consequent decrease in the number of complaints received by the health department about this nuisance insect.

In spite of the abatement of dengue in epidemic form, a major mosquito control program was continued in the Territory with federal assistance throughout 1944 and 1945. With the cessation of hostilities, a gradual reduction of military personnel working on mosquito control took place until by November, 1945, all soldiers had been removed from this program. The support of the U. S. Public Health Service was continued until the end of May, 1946, when that federal support also was withdrawn from the Territorial mosquito control program. Since that date there has been maintained under Territorial funds a minimal mosquito control program in the cities of Honolulu and Hilo, aimed mainly at the control of the *Aedes* mosquito, the spreader of dengue fever. This program is effectuated by approximately 30 persons and is maintained as a subdivision under the bureau of sanitation. Inspection units comprise a nucleus of well trained men who, in the event of another serious outbreak of dengue, could train additional workers and direct expanded mosquito control activities. These units can be sent to any part of the Territory where an outbreak of mosquito-borne disease might occur. Pyrethrum and DDT larvicides and adulticides are being widely used. The health department entomologist is doing continued research concerning methods of improving the dispersing of larvicide and of effectively eliminating breeders. Attempts are also being made

TABLE 2

*Proven Military and Civilian Cases of Dengue Fever Reported to the Board of Health, Territory of Hawaii, July, 1944, to June, 1946, by Month and Source of Infection*

Date		Source of Infection				Total
		Cases Acquired Within Territory		Cases "Off-Shipping"		
		Civilian	Military	Civilian	Military	
Month	Year					
July	1944	5	4	0	2	11
August	"	4	0	8	12	24
September	"	5	0	1	20	26
October	"	3	1	0	2	6
November	"	0	0	0	1	1
December	"	1	1	0	0	2
January	1945	0	0	0	0	0
February	"	0	0	0	0	0
March	"	1	0	0	0	1
April	"	1	0	0	0	1
May	"	1	0	0	0	1
June	"	9	0	0	0	9
July	"	1	0	0	0	1
August	"	0	0	0	0	0
September	"	0	0	0	0	0
October	"	0	0	0	0	0
November	"	0	0	0	0	0
December	"	0	0	0	0	0
January	1946	0	0	0	0	0
February	"	0	0	0	0	0
March	"	0	0	0	0	0
April	"	0	0	0	0	0
May	"	0	0	0	0	0
June	"	0	0	0	0	0
Total		31	6	9	37	83

to determine the effect of DDT and other larvicides on beneficial insects. Educational work on mosquito control is being continuously promoted, both on the adult level and throughout the school system of the Territory.

Table 2 shows the monthly incidence of dengue cases reported to the health department from July, 1944, to June, 1946. Cases are divided into civilian and military, and into those which were acquired within the Territory and those which were acquired outside the Territory, the latter being officially designated as "off-shipping" cases. The last case was reported in July, 1945.

#### DISCUSSION

It cannot be said that mosquito control activities and other measures to control dengue which were inaugurated at the onset of the epidemic in the Territory in 1943 and the abatement of the epidemic after only approximately 1,500

cases had occurred were assuredly cause and effect, since we were not dealing with a controlled scientific experiment but rather with an epidemic of a usually rapidly spreading disease among a group of humans in a forward area during a major world war. There is, however, much to indicate that the control measures actually did stop this epidemic in its tracks. In 1943 dengue was introduced into a non-immune population in Hawaii and into an area where there was a high *Aedes* mosquito breeding index occurring all the year around. Thus, factors were present conducive to the rapid spread of dengue to a great majority of the population in the built-up areas of the Territory. This has been the history of this disease heretofore when newly introduced into a community.

Not only were tried and true methods of mosquito control applied in a concentrated fashion to the city of Hono-

lulu and later to other areas of the Territory, but two new methods never before utilized in controlling widespread dengue in a community were inaugurated; namely, fogging the atmosphere with power sprays of insecticide and the use of a newly discovered and remarkably effective insecticide, DDT.

In peacetime it would be unlikely that health authorities could ever persuade the holders of public purse strings to expend enough funds to employ nearly one individual per 1,000 population for mosquito control in order to prevent the spread of a disease such as dengue. During a war, however, expenditures on a grand scale are the order of the day and a more intensive program to protect the health of a community having a vital part in the furtherance of that war could be put into effect than would normally be true. If a half or even a third of the military and civilian population of the Territory of Hawaii had been stricken with dengue in the summer of 1943, it is quite possible that the war effort in the Pacific would have been seriously hampered. Even in peacetime the expenditure would be economically sound, for the cost of having several hundred thousand persons sick with this disease for an average of 2 weeks per person would be considerably greater than the cost of control measures at \$2 to \$3 per person per year.

The need for a continued mosquito control program in the Territory is almost self-evident. Without continued education and surveillance concerning the control of the *Aedes* mosquito, the high prevalence of this insect in the Territory throughout the year would recur and the reintroduction of dengue into the community would in all probability soon result in a rampant spread of the disease into another epidemic.

Should such a situation arise, there is no longer the former large military

population or large war fund to which we could turn for aid in controlling the epidemic. There is every reason to believe that with increased incidence and speed of air travel between Hawaii and areas west of here, where dengue is present at all times, persons will be arriving in the Territory from time to time during the incubation period of the disease and developing clinical symptoms here. Although there is maintained a thorough program of spraying airplanes arriving in the Territory from other areas in order to kill all mosquitoes on board, it is still possible that some infected mosquitoes may be brought to Hawaii by airplane. With a low incidence of the mosquito vector of the disease, however, these sporadic arrivals should not cause the disease to become widespread among the inhabitants of our Territory.

#### SUMMARY

An epidemic of dengue fever started in Hawaii in July, 1943, when the Territory was an important military center of the war. Previously there had been no dengue reported in the Territory since 1912; consequently, no immunity to the disease was present in the population.

Owing to the danger that a widespread incidence of dengue would seriously hamper the war effort, an unusually vigorous attack was made upon the disease by both civilian and military personnel, under the guidance of the Territorial Board of Health. At one time 398 persons were assigned full time to mosquito control activities. One hundred and ninety-nine of these were working in the city of Honolulu. Nearly all mosquito control personnel were soldiers or were employed by the U. S. Public Health Service, although at the beginning of the epidemic emergency funds were used by the Honolulu Chamber of Commerce to hire men for mosquito control work.

During the year-long epidemic, only 1,498 cases of dengue were reported to the health department out of the Territorial population approximating 500,000 civilians and many thousands of military persons. All but two of these cases occurred in Honolulu. The usual history of dengue newly introduced into a community where the *Aedes* mosquito thrives has been a spread of the disease until 50 to 75 per cent of the population have contracted it.

The *Aedes* mosquito, carrier of dengue, was attacked by all known methods of mosquito control, including the use of DDT as soon as it became available. In addition, the atmosphere was fogged with insecticide around the homes of dengue patients, using high pressure Army sprayers attached to tank trucks.

An intensive educational campaign accompanied the activities of the mosquito staff and consequent excellent public support in fighting the *Aedes* mosquito was invaluable in reducing

the incidence of the carrier and in thereby checking the spread of the disease.

Within two months control measures brought the *Aedes* breeding index in Honolulu from 5.7 per hundred premises inspected to a level fluctuating a little over or under 1.0, where it remained as a result of continued control activities.

Sporadic cases of dengue have been reported since the epidemic year, but none have been reported since July, 1945. However, increased speed and frequency of airplane travel between Hawaii and areas to the west where dengue is continuously endemic means an ever-present threat of reintroduction of the disease. Consequently, a continued minimal mosquito control program is being carried on under Territorial funds.

#### REFERENCES

1. Usinger, Robert L. Entomological Phases of the Recent Dengue Epidemic in Honolulu. *Pub. Health Rep.*, 59, 13:423 (Mar.), 1944.
2. Gilbertson, Wesley E. Sanitary Aspects of the Control of the 1943-1944 Epidemic of Dengue Fever in Honolulu. *A.J.P.H.*, 35:261 (Mar.), 1945.

# Sudden Deaths of Infants Allegedly Due to Mechanical Suffocation\*

JACOB WERNE, M.D., AND IRENE GARROW, M.D.

*Office of the Chief Medical Examiner, City of New York, Borough of Queens;  
and the Department of Pathology, St. John's Long Island City and  
Flushing Hospitals, Flushing, N. Y.*

THE sudden death of an apparently healthy infant occurs with regularity in every large community. The circumstances surrounding the discovery of the body are frequently such that the laity immediately ascribes the death to smothering. Mattress, or bedclothes, or other crib objects found, or thought to have been found, in contact with the face, are incriminated; and if, as rarely happens today, the infant had been put to bed with another person, overlying of the infant by that person is assumed.

In this country during 1934, 834 such deaths were recorded under List 182 (Accidental Mechanical Suffocation) for infants under 1 year. The number of such cases during 1944, was 1,312, representing an increase of approximately 57 per cent during this 10 year period.<sup>1</sup> In the City of New York, the number of such cases has been said<sup>2</sup> to exceed those from measles, scarlet fever, and diphtheria combined, and to equal those from whooping cough. In the *Statistical Bulletin*<sup>3</sup> of the Metropolitan Life Insurance Company, smothering has been called the greatest hazard encountered during infancy. The fact that one-third to one-half of all fatal accidents during infancy are charged to

this cause has been the subject of editorial comment by both the *Journal of the American Medical Association*<sup>4a</sup> \* and the *New York State Journal of Medicine*.<sup>5</sup>

The Committee on Public Health Relations of the New York Academy of Medicine,<sup>6</sup> through widely publicized releases in both lay and medical press, has recently outlined specific measures for mothers to follow to prevent these so-called "unnecessary" deaths. This particular campaign was launched after Abramson<sup>2</sup> called attention to the excessive number of infants under 1 year of age dying from mechanical suffocation in the City of New York. The feeling of culpable negligence experienced by the mother or other person in attendance, and the resultant hostility of family and friends add considerably to the intensity of these tragedies. Since the conclusion that the infant has died as a result of a preventable accident may have serious implications, it should be accepted only after critical examination of the evidence on which it is based.

What is the evidence upon which the certification of death as due to accidental mechanical suffocation is based? It is

---

\* Presented before the Maternal and Child Health Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 11, 1946.

<sup>a</sup> The *Journal of the American Medical Association* <sup>4b</sup> later gave editorial notice to Davison's <sup>11</sup> work, showing that statistics relating to infant suffocation are misleading in that they err on the side of overestimation.



important to realize that at the present time we have no certain post-mortem criteria for the proof of asphyxial death, apart from finding the means of asphyxiation. For example, the rope in strangulation, and its anatomic effects on the neck. Proof of suffocation by such wilful manual force<sup>7</sup> which leaves no distinctive mark upon the body may be quite difficult to establish. Since the anatomic effects are not demonstrable, the conclusion that death resulted in this manner must at least be supported by the exclusion of all other causes of death.

During the past fifteen years, the authors have investigated 167 consecutive infants under 1 year of age, found dead in crib, carriage, or bed while in apparent health; belonging to the group which was ordinarily certified as dead of accidental mechanical suffocation.\*

In no instance has our investigation proved accidental mechanical suffocation of a healthy infant by bedclothes or in analogous manner.

natural cause of death, therefore excluding suffocation, were the following:

Mastoiditis and otitis media.....	20
Bronchopneumonia and otitis media.....	1
Bronchopneumonia .....	4
Lobar pneumonia.....	1
Congenital heart disease.....	7
Congenital heart disease and broncho- pneumonia .....	1
"Idiopathic" cardiac hypertrophy.....	2
"Idiopathic" cardiac hypertrophy and bronchopneumonia .....	1
Subdural hemorrhage.....	2
Bronchopneumonia and subdural hem- orrhage .....	1
Meningitis .....	2
Internal hydrocephalus.....	1

The cases of heart disease were frequently associated with acute respiratory infection.

In the 124 cases showing insufficient gross findings to explain death, comprising 74.3 per cent of our cases under 1 year of age, complete microscopic studies as a rule showed acute inflammation of the respiratory tracts, in association with other significant visceral

TABLE 1—DEATH RATE IN THE U. S. FOR ACCIDENTAL MECHANICAL SUFFOCATIONS (LIST NO. 182, INTERNATIONAL CLASSIFICATION) FOR THE YEAR 1944

Cause	All Ages	0-1 yr.	1-4 yrs.
Accidental mechanical suffocation	1.2	51.1	0.5

Table 1 indicates that this certification rarely occurs after 1 year of age. In 43 (25.7 per cent) of our 167 cases under 1 year of age in which accidental mechanical suffocation was alleged, the autopsy alone established the presence of fatal disease.

The gross findings in these 43 cases which were adequate to establish a

changes. The lesions encountered have been previously described.<sup>8</sup> They included tonsillitis, laryngotracheitis, bronchitis, bronchiolitis, interstitial pneumonia, and hemorrhagic bronchopneumonia not grossly detectable. There were lesions frequently in the other organs, including the brain, liver, kidneys, and lymphatic tissues. These lesions were conspicuously absent from the tissues of 31 infants dying of proved violence.\*

In all of the 124 cases showing at autopsy insufficient gross findings to ex-

\* In the City of New York, all deaths occurring suddenly or unexpectedly, or without medical attendance, or in any unusual manner, or charged to violence, are referred to the Office of the Chief Medical Examiner. During the calendar year 1944 this office investigated 16,155 cases, approximately 25 per cent of the total deaths recorded by the Department of Health. In the Borough of Queens, having a population of over 1 1/2 million, the Medical Examiner's records comprise over two per cent of the deaths annually.

\* These cases included 15 of suffocation (most of them infanticide), 6 of drowning, 2 of crushing injuries, 1 of carbon monoxide poisoning, 5 of burns, 1 of ether anesthesia, and 1 of naphtha poisoning.

plain death, the microscopic study indicated fulminating respiratory disease as the best possible explanation for death, with the following exceptions: three cases in which enterocolitis (one due to salmonella) associated with pneumonitis appeared to be the primary cause of death; 4 cases in which dermatitis was associated with pneumonitis; 1 case in which post-vaccinal encephalitis was the cause of death; 1 case in which, in addition to evidence of respiratory disease, recent immunization may have been a factor in causing death by delayed anaphylatic shock, and 6 cases in which no conclusion as to a cause of death was reached. In the last group no tissues were available for microscopic study.

Furthermore, we have also investigated 67 other infants who had been observed to die suddenly and unexpectedly, under circumstances in which there could be no possible allegation of smothering. It is noteworthy that in these infants, observed to die suddenly and unexpectedly, therefore not allegedly smothered, acute respiratory disease was the usual cause of death. The same cause of death, that is, acute respiratory disease, was the usual one in the cases under present consideration, in whom smothering is ordinarily alleged.

In 38 infants there were sufficient gross anatomic findings to identify the disease causing death, as follows:

Mastoiditis and otitis media.....	8
"Idiopathic" cardiac hypertrophy and otitis media.....	1
"Idiopathic" cardiac hypertrophy.....	4
Congenital heart disease.....	9
Bronchopneumonia .....	2
Congenital heart disease and broncho- pneumonia .....	2
Lobar pneumonia.....	1
Interstitial pneumonitis with bilateral hydrothorax .....	1
Bilateral adrenal hemorrhage due to meningococcemia .....	3
Bilateral adrenal hemorrhage in which no organisms were recovered.....	1
Meningitis due to Friedlander's bacillus...	1

Meningitis due to pneumococcus type III..	1
Meningitis due to pneumococcus untyped..	1
Impetigo of new-born.....	1
Hydronephrosis and pyelonephritis.....	1
Intraventricular hemorrhage.....	1

In 29 infants, there were insufficient gross findings to explain death, but completed microscopic study disclosed the same lesions as in the group allegedly smothered and established acute respiratory infection as the primary cause in 22 cases. In two more, this was associated with encephalitis, in one with dermatitis and in two with enterocolitis (one of which was due to *Salmonella enteritidis*). In two other cases no tissues were available for microscopic study and no conclusion was reached as to the cause of death.

The importance of the microscopic examination is too well appreciated by pathologists to require emphasis. It is nevertheless necessary to state that the medicolegal pathologist has even greater need of this essential technique than does his colleague in hospital practice. The latter, by contrast, has the benefit of a full clinical record, frequently containing the results of informative laboratory tests.

It has been our experience that when the microscopic lesions described above occur there is often a history of upper respiratory infection in the deceased infant, or a contact, or both. Not infrequently there is respiratory illness in the entire family at the time of death, or shortly thereafter. Of the 124 infants found dead while in apparent health and showing at autopsy insufficient gross findings to explain death, there was a definite history of symptoms referable to respiratory infection in at least 25, and a questionable history in 6; in 78 cases those in attendance could recall no untoward antecedent signs, and in 16 no reliable information was available.

In 44 cases of this series there was a positive history of contact with one or

TABLE 2—DEATH RATE IN THE U. S. FOR ACCIDENTAL MECHANICAL SUFFOCATIONS (LIST NO. 182, INTERNATIONAL CLASSIFICATION) FOR THE YEAR 1944

Cause	Under											Total	
	1 mo.	1 mo.	2 mo.	3 mo.	4 mo.	5 mo.	6 mo.	7 mo.	8 mo.	9 mo.	10 mo.	11 mo.	Under 1 yr.
Accidental mechanical suffocation	208	279	272	209	122	85	53	33	22	12	9	8	1,312

more persons known to have been suffering with acute respiratory disease. In 3 instances there was a doubtful history of contact, and in 4 cases contact was denied by those in attendance. In the remainder, the records did not show that inquiry was made concerning this point.

The suddenness of death so stuns the family that attempts to obtain a reliable history on the first visit to the scene are frequently unsuccessful. Those in attendance often recall, at a subsequent interview, signs and symptoms in the deceased and the contacts to which no significance was attached at the time.

In 4 cases, the subject was one of twins. The other twin subsequently developed clinical disease. In 2 instances, this was pertussis. We have encountered cases allegedly suffocated in families in which other children at the time had pertussis, or mumps. In such cases, the histological findings were characteristic of these diseases.

Analysis of the age incidence of the deaths under consideration discloses that they occur infrequently during the first month and after the first year. The majority are seen in the first 6 months (Figure 1). The peak in our experience is reached during the third and fourth months. The mortality tables for List

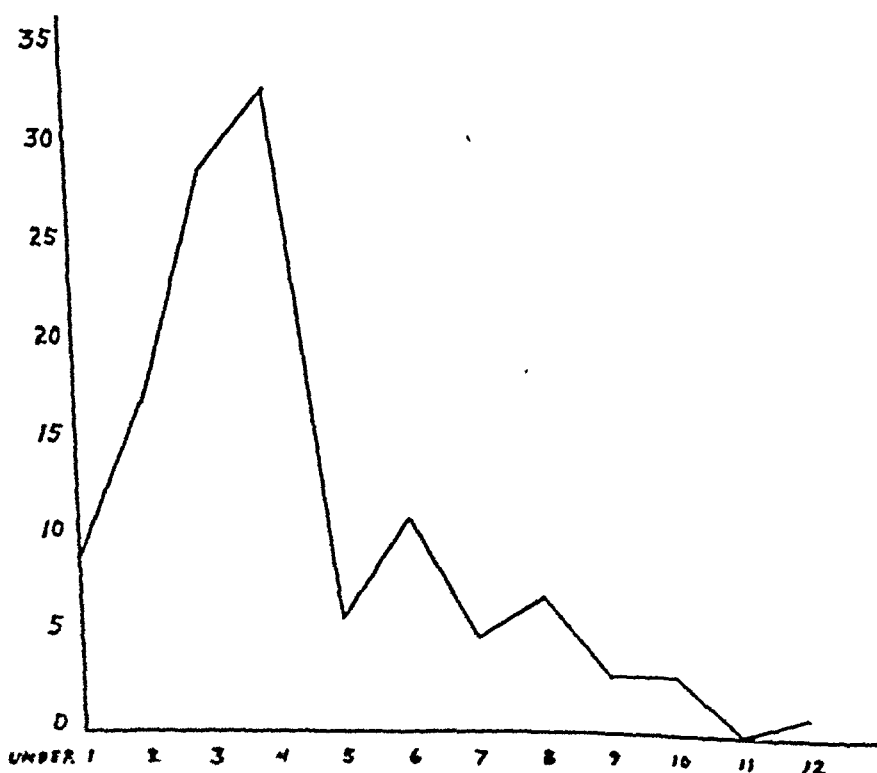


FIGURE 1.—The incidence (by month) of infants dying of alleged mechanical suffocation while in apparent health, showing at autopsy insufficient gross findings to explain death. 124 cases

182 (Accidental Mechanical Suffocation) (Table 2); the series of 139 cases of "mechanical suffocation" collected by Abramson<sup>2</sup>; and the incidence of deaths due to acute respiratory disease (Lists No. 104-114 inclusive) for New York City during 1942,<sup>9</sup> show a similar age incidence (Figure 2).

may be explained by assuming (1) that there is less exposure to infection, (2) that the infant is still protected by maternal antibodies. As these wear off and contact increases, infections take their toll. Freund<sup>10</sup> in 1926, and Baumgartner<sup>11</sup> in 1934 showed for rabbits that the formation of antibodies is deficient in

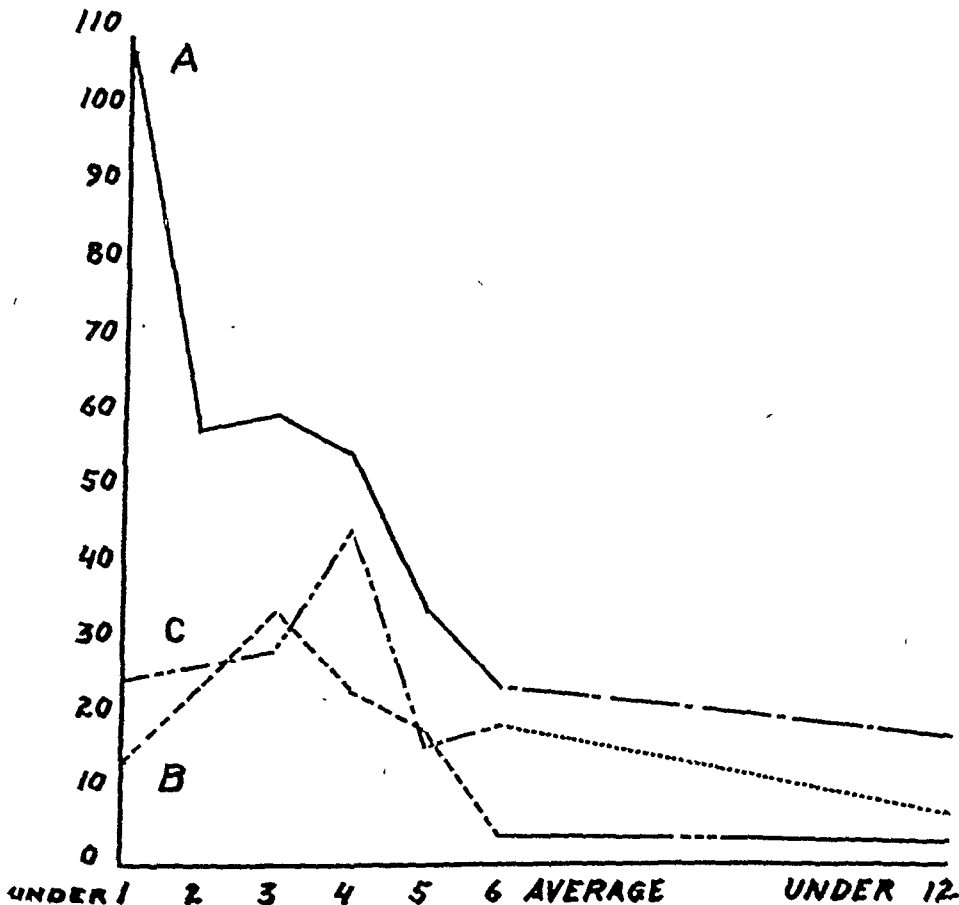


FIGURE 2—Incidence of deaths by month of age in (a) New York City 1942 certified as acute respiratory disease (Lists 104-114): 443 cases. (b) Deaths in New York City 1939-1943 collected by Abramson<sup>2</sup> certified as due to accidental mechanical suffocation: 139 cases. (c) Present study: 167 cases.

The low incidence during the first month of life is paradoxical if one accepts mechanical suffocation as an explanation for these sudden deaths. It is precisely during this period, when the infant is weakest, that a maximum number of such deaths would be expected.

The relative freedom of the first month of life from this cause of death

very young as compared with adult animals. If antibody production can be taken as a measure of immunity, and if these animal findings are applicable to human beings, an explanation for the observed age incidence may be at hand.

The maximum seasonal incidence in our cases as well as in all those certified as accidental mechanical suffocation is during the winter months. The same

seasonal as well as age incidence will be found for fatalities from known respiratory diseases (Figure 3).

We have so far considered the positive evidence in our own experience for the existence of significant disease as an explanation for sudden unexpected death of apparently healthy infants. We might now inquire into the prevailing attitude of medical examiners and coroners toward this problem. For this purpose, as noted previously, the original records of one of the better organized jurisdictions were examined;

they included during one year 44 certifications of infant deaths as accidental mechanical suffocation (Table 3).

Of the 44 cases, 12 were autopsied and 32 were not. Of those autopsied, the brain was described in only 10; the neck organs in 7; the middle ears and mastoids, in none. Microscopic examination was recorded in only one single instance. This was described as "negative." There was no record of such examination in the remaining 43 cases. Thus, not only was there failure to perform autopsies, but failure to

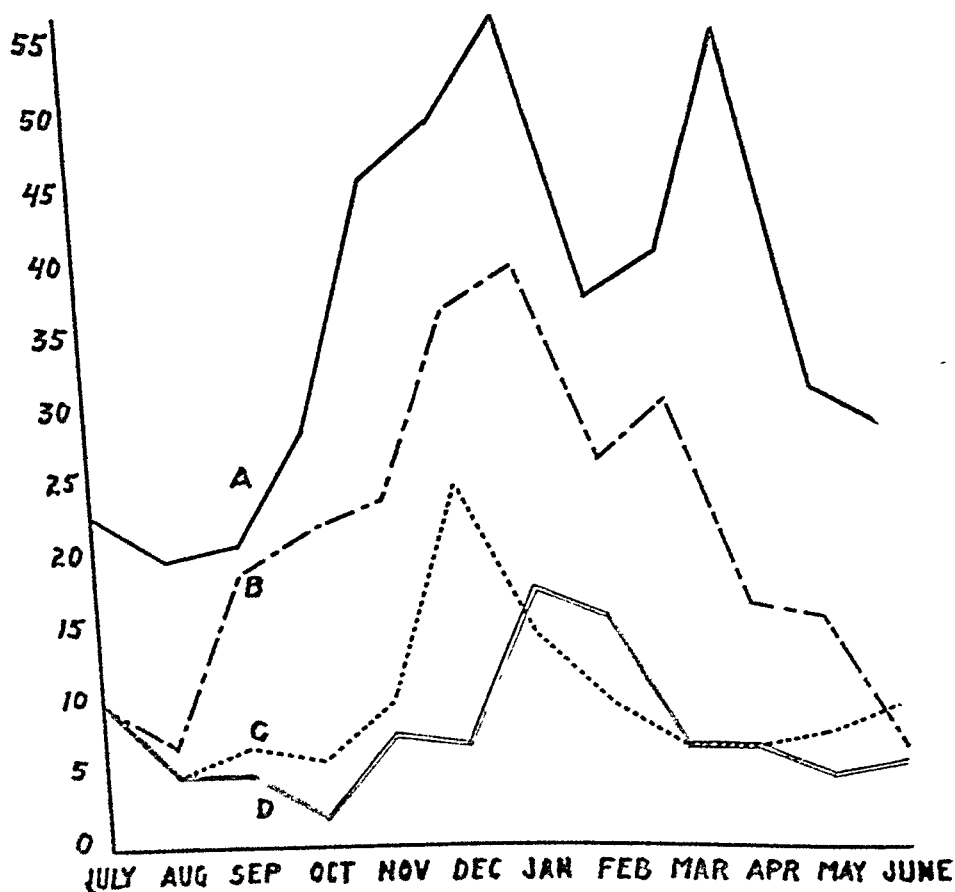


FIGURE 3.—Incidence by month of occurrence of (a) New York City 1942 certified as acute respiratory disease (Lists 104-114): 443 cases. (b) Division of Health allegedly dead of suffocation proved by autopsy as dying of acute respiratory disease. (c) Deaths in New York City 1939-1943 collected by Abramson<sup>2</sup> certified as due to accidental mechanical suffocation: 137 cases. (d) Present study: 167 cases.

TABLE 3—44 CASES OF "ACCIDENTAL MECHANICAL SUFFOCATION"—12 AUTOPSIES FROM ANOTHER JURISDICTION 1942

Brains examined: 10	Neck Organs described: 7	Mastoids described: 0
<i>Autopsy findings:</i>		
Congenital Heart Disease ("Patent Foramen Ovale").....		1
Bronchopneumonia (autopsied after certification).....		1
Edema of Larynx ("non-occlusive").....		1
<i>Description of scene:</i>		
Face down .....	25	
On side .....	2	
"Entangled in bedclothes" .....	11	
Found "choking" .....	1	
Not described .....	5	
<i>Histories:</i>		
"Apparent good health" .....	14	
Known to have colds .....	4	
"Sickly" .....	1	
Exposed to bronchitis.....	1	
No information .....	24	

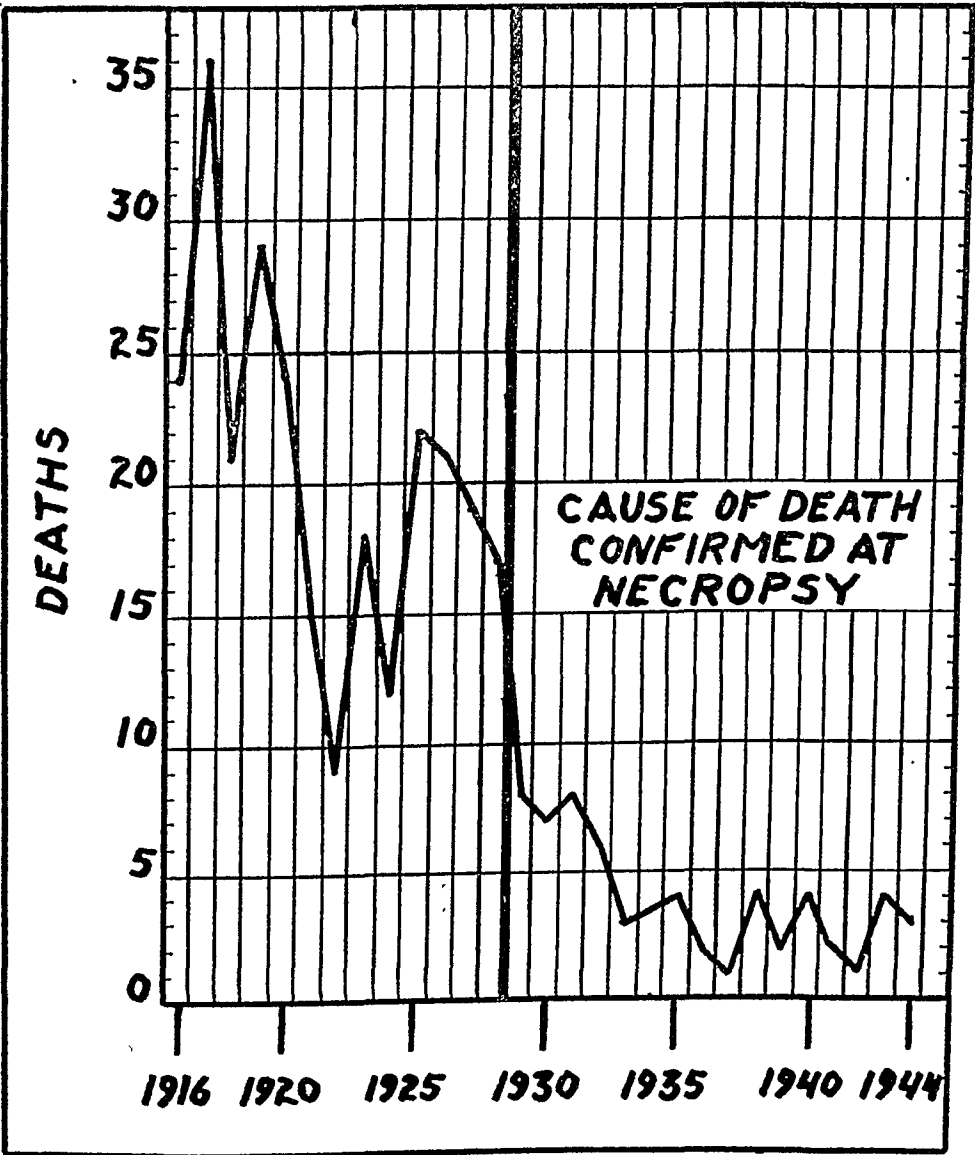


FIGURE 4—Experience of Davison <sup>12</sup> in showing diminished incidence of deaths certified as due to mechanical suffocation, as the result of instituting autopsies in these cases.

TABLE 4—COMPARISON OF MORTALITY TABLES (LISTS 67, 182, AND 200, INTERNATIONAL CLASSIFICATION, FOR THE YEAR 1944, FOR INFANTS UNDER 1 YEAR

	United States	Texas	New York	California
All causes	113,949	7,744	6,950	4,586
Diseases of thymus gland	1,012	45	64	66
Accidental mechanical suffocation	1,263	46	83	49
Ill-defined and unknown	5,510	342	14	12

TABLE 5—COMPARISON OF MORTALITY TABLES FOR LISTS NO. 67, 182, AND 200 IN NEW YORK CITY, UNDER 1 YEAR

	International List No. 67 (Diseases of Thymus Gland)	182 (Accidental Mechanical Suffocation)	200 (Cause of Death Not Specified or Ill-defined)	
	No. 67	No. 182	No. 200	Total
1937	20	25	16	61
1938	26	28	1	55
1939	15	25	6	46
1940	16	38	3	57

make microscopic studies. Besides these deficiencies, there was another source of error. In 3 cases, the autopsy protocol indicated a different cause of death: laryngotracheitis, or bronchopneumonia, or congenital heart disease. Yet these cases had been certified as accidental mechanical suffocation.

Since in 25.7 per cent of our cases gross autopsy findings immediately excluded death by accidental mechanical suffocation, all such certifications without autopsy may be considered inaccurate. Furthermore, we may consider as unsatisfactory all autopsies in which there was failure to examine the brain, the mastoids, the middle ears, and the neck organs, in addition to the routine dissection of the thoracic and abdominal viscera. We may also disregard all cases that have not had a complete microscopic examination.

The experience of Davison<sup>12</sup> (Figure 4), Coroner of Birmingham, England, is of interest in this regard. From 1918 to 1924, 130 instances, about 21 cases per year, of accidental mechanical suffocation were recorded. From 1938 to 1944, the number of cases dropped to 18, or about 3 per year. Since during the earlier period the population was about 550,000, and during the later period, about one million, the actual

drop was from 21 to 1½ per year, in relation to the total population. Davison states that autopsies became routine in these cases only after 1926. The lag in the drop between 1926, when autopsies were instituted, and 1938, when the incidence of this certification became low, can be explained by the interval that may elapse between the realization of the problem, and the acquisition of sufficient pathological experience to find the lesions and assess their significance. We admit that several years elapsed before such diagnoses as accidental mechanical suffocation, and status thymicolymphaticus\* disappeared from our own records.

Tables 4 and 5 show the incidence of these certifications in the country at large, in several states, and in New York City. The extreme variability in the occurrence of List 67 and 182 can only be explained by assuming that the criteria for these diagnoses are most indefinite. By contrast, the incidence of such standard causes of death as lobar pneumonia, for which clinical and

\* The best opinion in this regard has been aptly expressed by Holt and McIntosh.<sup>13</sup> "Status lymphaticus is no longer regarded as an explanation of sudden death. It is now recognized that infants and children who die suddenly from any cause exhibit a relative enlargement of the thymus and other lymphoid structures, which is merely an expression of good nutrition."

**STATUS LYMPHATICUS**

30/40

**ACCIDENTAL ASPHYXIA  
IN INFANCY**

30/40

FIGURES UNDER EACH BOROUGH SHOW  
TOTAL DEATHS OF INFANTS UNDER 1YR  
FOR 1940.

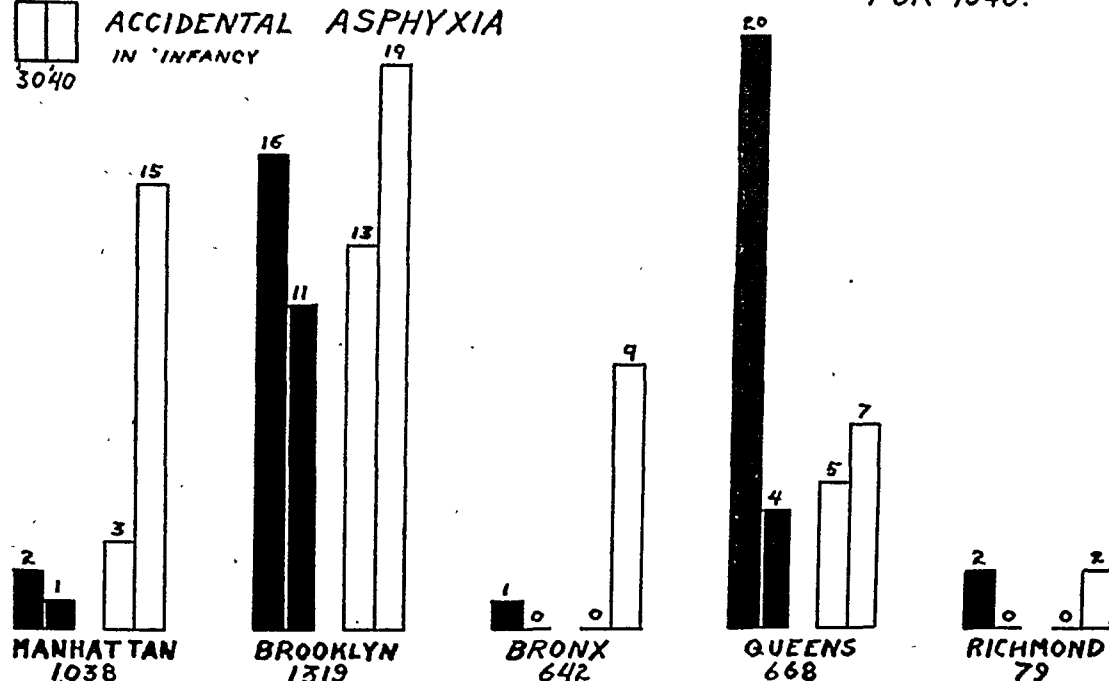


FIGURE 5

pathological evidence is easily obtained, shows no such bizarre characteristics. It is noteworthy that drowning, an accidental cause, maintained a consistent level in the Boroughs of New York City over the years (Figures 5 and 6).

Although the evidence we have assembled indicates that accidental mechanical suffocation is hardly an acceptable explanation for sudden death during infancy, nevertheless such certifications have increased considerably during recent years. An explanation for this increase may be found in our mortality tables under Lists 67 and 200,

diseases of the thymus gland (mainly status thymicolymphaticus) and ill-defined or undetermined causes of death respectively. It may be noted that the increase in certifications under List 182 reflects the decrease seen in those under 67 and 200 (Table 5).

We have shown (1) that there is no anatomic evidence for asphyxial death as such,<sup>14</sup> (2) that in the cases allegedly dying of accidental mechanical suffocation, the pathological investigation established another cause of death as a rule. Upon what evidence then are certifications of accidental mechanical suffocation ordinarily made? We be-

TABLE 6—COMPARISON OF CERTIFICATIONS IN NEW YORK CITY  
(LISTS NOS. 67 AND 182) UNDER 1 YEAR

	Status Lymphaticus		Accidental Asphyxia	
	1930	1940	1930	1940
Manhattan	2	1	3	15
Brooklyn	16	11	13	19
Bronx	1	0	0	9
Queens	20	4	5	7
Richmond	2	0	0	2



# FREQUENCY OF PNEUMONIA AND SUBMERSION AS CAUSE OF DEATH BY BOROUGHES IN 1933 AND 1940

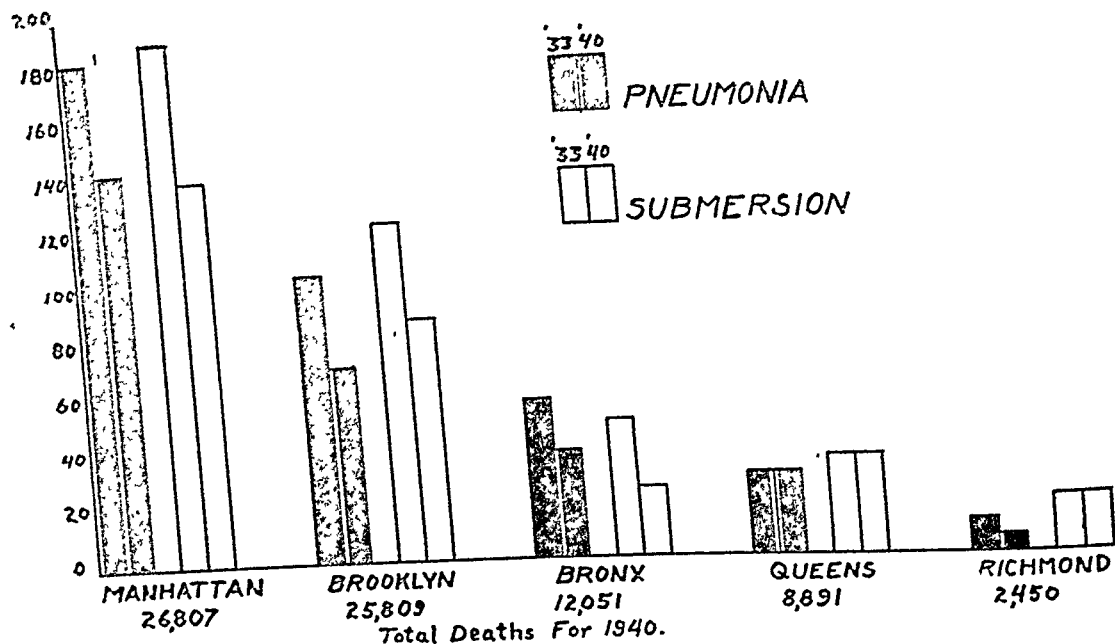


FIGURE 6

lieve that they are based on a misinterpretation by the layman. This misinterpretation receives endorsement from the medical examiner or coroner who stops his investigation at the scene of death. We do not wish to minimize the significance of the visit to the scene. In certain cases this may be the most important element of the medicolegal investigation. However, it is never sufficient in itself, and its value must be measured in terms of the reliability of the information it provides. When an adult is unexpectedly found dead, the body is usually undisturbed before the arrival of the medical examiner or coroner. The same situation does not obtain in the case of infants. When first discovered, though it may be suspected that the infant is in a critical condition or even dead, attempts at resuscitation are usual. In the resultant confusion, the position of the body at death is changed. It can seldom be accurately reconstructed. However, assuming that most of these cases

actually are found with face down or face covered, as reported, the mothers usually state that it was the infant's habit to sleep in the prone position. It is common knowledge that infants often prefer this position. Bedclothes or blankets so often described as completely covering the face were never, in our experience, judged to have been so closely applied as to prevent all access of air. We agree with Archibald<sup>15</sup> that the well baby will resist all attempts at suffocation. In experimental animals, attempts at suffocation result in violent struggling. The struggling movement of babies provoked by any impediment to breathing would probably dislodge the amount of bedclothes ordinarily incriminated.

Although important from the medical and public health standpoint, the accurate certification of these deaths possesses another aspect of practical significance. If they are due to suffocation, then Abramson's<sup>2</sup> advice should be followed by mothers: that is, infants

should never be permitted to assume the prone position unless constantly guarded. On firmer ground, in our judgment, rests the suggestion of Adams<sup>16</sup> that by placing the infant in this position, postural drainage of infected secretions from the tracheobronchial tree may lessen the likelihood of pneumonia.

The conception that fulminating infections are responsible for sudden unexpected death is not a new one. Farber<sup>17</sup> cites a case in which Wolbach, at the turn of the century, diagnosed meningitis by microscopic examination in a case previously certified as dying of status thymicolymphaticus. Farber,<sup>17</sup> and Goldbloom and Wigglesworth<sup>18</sup> have described instances of sudden unexpected death during infancy associated with fulminating respiratory infection.

Sudden death is rare in infants, and still more rare in adults who are apparently healthy or are suffering from "minor" diseases. When it occurs while the infant is being observed during the fatal collapse, or is found dead with suffocation excluded by the circumstances at the scene, microscopic lesions can almost always be seen, as our series of medicolegal cases shows. These microscopic changes correspond with those found in fulminating diseases, mostly respiratory infections. We found the same type of microscopic lesions in infants allegedly dead of accidental suffocation.\*

The significance of such microscopic lesions may be obscured by the presence of advanced gross pathological changes that occur in infants, children, and adults who are hospitalized because they suffer from frank pneumonia, meningitis, or other diseases. The pathologist who studies hospitalized patients usually looks for and usually finds in his material the anatomical changes characteristic for the specific disease. Fur-

thermore, the source of material for the pathological study of sudden death is very limited in hospital pathological laboratories as compared with the source of material of the medicolegal pathologist who investigates sudden death in a large population.

The medical examiner sees far more cases in which sudden death is unassociated with fully developed disease in the conventional sense. Since in many of his cases microscopic changes may be the only features of a fatal disease, attention must be focused upon these microscopic changes if they are to be discovered. An objection that might be raised in this regard is well disposed of by Burke-Gaffney<sup>19</sup>:

Even microscopic lesions may be the only features accountable for death. It will be said that microscopic lesions will rarely occur without manifesting themselves macroscopically as well. Were this true, their very rarity would in itself be a particular reason for keeping them in mind, but in fact they can and do occur as the sole evidence of morbidity in a surprisingly large number of cases. That they are easily missed is to be explained by the very excellent and somewhat obvious reason that they are microscopic. The presence of such lesions playing an unsuspected but essential part in medicolegal practice I will not endeavor to illustrate by means of examples taken from my own cases . . . .

The histological lesions which we have encountered in the cases under present discussion reflect associated physiological disturbances which may be regarded as the best available explanation for such deaths. There seems to be an apparent discrepancy between the extent of pathological changes and the fatal outcome, in infants found dead while in apparent health. In this connection consideration should be given to the following point: Death in many infectious diseases is preceded by and is probably the result of medical shock. The factors which bring about circulatory collapse or medical shock have not been exactly determined; there is no exact relationship between severity

\* In 6 of the earliest cases, as stated previously, sections were not available for study and therefore such cases are classified as of undetermined cause of death.

of clinical or gross anatomical changes in infectious diseases and the probability of shock and death, or recovery. The clinical improvement of a patient just after the crisis of lobar pneumonia is dramatic; but the x-ray examination still shows massive involvement of the lung. It is well known that gross morphological changes do not necessarily reflect the prognosis of a disease. Patients with pneumonia involving both lungs may recover; and others with involvement of one lobe may die. In some who die, only a small patch of consolidation may be demonstrable grossly or, as in the case of the infants under discussion, the involvement may be microscopic.

The susceptibility of infants to trauma is well known. An extent of skin burn or crushing injury from which an adult might easily recover has been repeatedly known to cause death during infancy. Diarrhea may cause death in infants although the clinical course may seem mild and the anatomical findings in the intestines be limited to slight congestion. Kahn<sup>20</sup> found that adult rabbits react vigorously at the site of intracutaneous injection of hemolytic streptococcus but do not die; whereas very young rabbits hardly develop a local inflammatory reaction and die with bacteremia. This observation confirmed that of Freund<sup>21</sup> who used pneumococci in a similar experiment.

We have found morphological evidence of systemic involvement in apparently mild upper respiratory infections.<sup>22</sup> The "bronchitis" which might easily be weathered by the average adult may in susceptible infants prove to be a fatal system disease.

Under the title of pulmonary congestion, Brouardel<sup>23</sup> in 1896 stressed the importance of "bronchitis" (also known as capillary bronchitis) as a cause of sudden death during infancy:

Another common cause of sudden death, in children 2 or 3 months old, is bronchitis.

Bronchitis is one of the most dangerous diseases to which children are liable; the child cannot cough; it does not know how to expectorate, or how to free itself from the obstruction to its breathing; part of the respiratory area thus becomes useless, and the lesions just described, of atelectatic portions of the lungs, are found post-mortem; it is Laennec's "suffocating catarrh." Bronchitis is probably the explanation of many cases of so-called "overlying"; laryngismus stridulus will account for many more; but still in some, as in the following one, death is simply the result of accidental smothering; the child being placed to sleep in a large bed, and slipping down beneath the bedclothes, or turning face downwards on a large soft pillow.

With all except the last part of this statement of Brouardel,<sup>23</sup> we are in complete agreement. We would prefer to consider his occasional case that "slipped down beneath the bedclothes or turned face downwards on a large soft pillow" as part of an expected percentage in which, by all the means available to competent hands, in the light of existing knowledge, no cause of death may be demonstrable.

Especially in our early cases, we have encountered deaths for which the cause still remains undetermined. Their number has diminished with increasing experience and more extensive pathological study. The proper approach to this problem, however, requires that failure to find a cause of death be readily admitted and honestly recorded; and not concealed under such listing of our mortality tables as accidental mechanical suffocation and status thymicolymphaticus.

#### SUMMARY AND CONCLUSIONS

List No. 182, accidental mechanical suffocation (of the *International List of Causes of Death*), is erroneous. There were 1,312 such cases under 1 year of age, certified throughout the United States during 1944, an increase of approximately 57 per cent over the previous decade.

In 167 consecutive cases of infants allegedly suffocated in crib, carriage or bed, 74.3 per cent of whom showed at autopsy insufficient gross findings to explain death, microscopic study revealed fulminating respiratory disease in the great majority of instances. The significance of these findings was further confirmed by their absence in actually healthy infants dying of proved violence and their presence in infants observed to die suddenly and unexpectedly of proved respiratory infection.

Efforts to prevent sudden death of infants should be directed toward diminishing exposure to known sources of infection during this highly vulnerable period of the infant's life; and to the education of parents in the early signs of acute respiratory disease and their significance. It is further suggested that the American Public Health Association appoint a commission consisting of pediatricians, pathologists, and health officers for the comprehensive study of this important problem of sudden death during infancy.

## REFERENCES

1. a. *Vital Statistics, Special Reports*, Dept. of Commerce, Bureau of the Census, Vol. 25, No. 5.
- b. *Ibid.* Vol. 25, No. 12.
- c. Dept. of Health, City of New York *Health for 7,500,000 People*, 1937.
- d. *Health for New York City's Millions*, 1938.
- e. *Advances in New York City's Health*, 1939.
- f. *Twelve Months of Health Defense*, 1940.
- d. *Vital Statistics, Special Reports*, Dept. of Commerce, Bureau of the Census, Vol. 7, No. 24.
- e. Personal Communication from the Registrar, New York City Dept. of Health.
2. Abramson, Harold, Accidental Mechanical Suffocation in Infants. *J. Pediat.*, 25:404 (Nov.), 1944.
3. Fatal Accidents to Infants in Wartime. *Stat. Bull.*, Metropolitan Life Insurance Co. Nov., 1942.
4. a. Fatal Accidents to Infants in Wartime, Editorial. *J.A.M.A.*, 121:263 (Jan. 23), 1943.
- b. Accidental Suffocation of Infants, Editorial. *J.A.M.A.*, 129:1021 (Dec. 8), 1945.
5. Infant Deaths from Mechanical Suffocation. *New York State J. Med.*, 45:14, 1529, 1945.
6. Infant Deaths from Mechanical Suffocation. *Annual Report, New York Acad. Med.*, 1945, p. 40.
7. Gonzales, Thomas. A. Manual Strangulation. *Arch. Path.*, 15:55 (Jan.), 1933.
8. a. Werne, J. Postmortem Evidence of Acute Infection in Unexpected Death in Infancy. *Am. J. Path. & Bact.*, 18:759 (July), 1942.
- b. Werne, J., and Garrow, I. Unexpected Deaths of Infancy and Early Childhood. *Proc. New York Path. Soc.*, Feb. 25, 1943.
- c. Werne, J., and Garrow, I. Sudden Deaths in Infancy. *Bull. New York Acad. Med.*, 21:445 (Aug.), 1945.
- d. Werne, J., and Garrow, I. Histopathological Findings Establishing Death from Acute Respiratory Disease in Infants Found Dead While in Apparent Health (to be published).
9. Personal communication from Registrar, New York City Department of Health.
10. Freund, Jules. Influence of Age upon Antibody Formation. *J. Immunol.*, 18:315 (Apr.), 1930.
11. Baumgartner, L. Age and Antibody Production; Qualitative Changes in Antisera Associated with Age. *J. Immunol.*, 27:407 (Oct.), 1934.
12. Davison, W. H. Accidental Infant Suffocation. *Brit. M. J.*, Aug. 25, 1945.
13. Holt and McIntosh. *Prognosis and Infant Mortality; Holt's Diseases of Infancy and Childhood*, 11th ed.; New York and London, 1939, pp. 60-61.
14. Werne, J., and Garrow, I. Absence of Specific Morphological Findings in Asphyxial Deaths (to be published).
15. Archibald, H. C. Sudden Unexplained Death in Childhood—Can it be Prevented? *Arch. Pediat.*, 59:57 (Jan.), 1942.
16. Adams, John M. A Revaluation of the Pneumonias of Infancy. *J. Pediat.*, 25:369 (Nov.), 1944.
17. Farber, Sidney. Fulminating Streptococcus Infections in Infancy as a Cause of Sudden Death. *New England J. Med.*, 211:154 (July 26), 1934.
18. Goldbloom, A., and Wigglesworth, F. W. Sudden Death in Infancy. *Canad. M.A.J.*, 38:119, 1938.
19. Burke-Gaffney, H.J.O. Some Medico-Legal Aspects of Investigation of Sudden and Unexpected Death. *East African M. J.*, 10:232-242 (Nov.), 1933.
20. Kahn, R. L. Difference in Response of Skin of Young and Adult Animals to the Injection of Living Microorganisms. *Tissue Immunity*, 1936, p. 423.
21. Freund, Jules. Reaction of Young and Adult Rabbits to Pneumococci Injected into the Skin. *J. Exptl. Med.*, 54:171-180, 1931.
22. Werne, J., and Garrow, I. A Morphological Basis for Systemic Involvement in Acute Respiratory Infection. (To be published.)
23. Brouardel, P. *In Death and Sudden Death*, 1896, Brouardel and Benham, F. L.

# Appraisal of Nutritional Status

Including Some Recent Observations on Iron and *Lactobacillus casei* Factor (Vitamin M, Folic Acid) \* †

WILLIAM J. DARBY, M.D., PH.D.

*Departments of Medicine and Biochemistry, Vanderbilt University  
School of Medicine, Nashville, Tenn.*

NUTRITION surveys such as those which have been made in Tennessee<sup>1</sup> and North Carolina<sup>2</sup> have consisted of dietary studies, laboratory assessments of nutritional status, and careful physical examinations for signs of nutritional deficiencies. These surveys were made in part to provide a basis for action by public health administrative bodies. The data from the surveys have not always supported preconceived notions of the problems in the area, and analysis of the data has led to the serious questioning of the validity of some widely employed criteria of deficiencies. A study of the data from surveys and other sources has led to the suggested definitions of various zones of nutriture from clinically manifest deficiency disease to zone of saturation and to the conclusion that the clinical definition of physical normality, i.e., the state of one who is well and not handicapped by some disturbances manifested by symptoms,<sup>3</sup> may be the most useful one for the application to nutrition work.<sup>4</sup>

Epidemiologic approaches to nutritional problems have been most fruitful

in the past; as examples one may recall the study of the relationship between iodine deficiency and goiter, fluorine and dental health, diet and beriberi, xerophthalmia and vitamin A, or consumption of corn and pellagra. In all of these now classic studies correlations were obtained between food intake and disease conditions. Similar approaches should continue to be fruitful if health impairments in the population are due to malnutrition. The failure to find correlations between measurements of intake and the evidences of health performances may be taken to indicate that: (1) no relationship exists between the two variants, or (2) a third variant exists which obscures the relationship between these two tested. It has been stated<sup>5</sup> that the third factor thus obscuring some correlations is time, i.e., that lack of correlation is due to changes in dietary habits since the development of the physical stigma. If so, one might reasonably regard such stigmata as scars and, therefore, not manifestations of *currently existing* deficiencies. However, others<sup>4, 2b, d, c, 7</sup> have felt that the frequently noted lack of correlations between measures of intake and occurrence of physical findings was more likely due to the non-specificity of the clinical findings. There is no doubt that various physical signs of deficiencies may be met with in the general population, but reasoning that the appearance of these

\* Presented at the Joint Meeting of the Food Industries Advisory Committee and the Scientific Advisory Committee of the Nutrition Foundation, Inc., Washington, D. C., April 5, 1946.

<sup>1</sup> The studies from Vanderbilt University upon which much of this paper is based were made possible in part from the Nutrition Foundation, Inc., the International Health Division of The Rockefeller Foundation, and the Tennessee Department of Public Health.

abnormalities is always due to a simple dietary deficiency and that the incidence of a sign, in absence of supporting data, is a measure of a given dietary deficiency is illogical. The exploration of the reason for lack of expected correlations may be enlightening and provide a sounder basis for the interpretation to public health administrators of the nature of nutritional defects which deserve correction.

These points may be illustrated by the following findings from our surveys and clinic: In a survey in a rural county in North Carolina<sup>2c, d</sup> in 1943-1944 there was found to be no difference in the incidence of corneal vascularization or dilation of the limbic plexus (signs often employed as indicators of riboflavin deficiency), between those groups of persons recording a daily intake of 1.35 mg. or more of riboflavin and those obtaining less than this amount. In the group of 25 white persons exhibiting angular fissures and/or tongue changes resembling those seen in riboflavin deficiency, only 4 individuals failed to present some obvious cause of the lesions other than ariboflavinosis, and but 1 of these 4 had a daily intake of less than 0.7 mg. of riboflavin. It was concluded that ariboflavinosis was not a serious problem in this region. It was noted, however, that certain of the persons with lingual changes and reasonably adequate dietary intakes of riboflavin also had a definite anemia. Furthermore, the glossitis, cheilosis and anemia, but not the corneal invasion, of one of the subjects responded promptly to the administration of iron and riboflavin.<sup>8</sup>

This observation, coupled with the finding of Waldenström,<sup>9</sup> that the oral lesions of Plummer-Vinson syndrome<sup>10</sup> respond to therapy with iron alone, led to a detailed study of patients exhibiting such oral lesions. It has now been demonstrated<sup>8</sup> that angular fissures and superficial glossitis may accompany

chronic iron deficiency anemia of mild degree; that subjects with this combination of findings were deficient in iron was proved by use of radioactive iron absorption studies as developed by Dr. P. F. Hahn and his coworkers.<sup>11</sup> Finally, it was demonstrated that in these cases the oral lesions do not respond to vitamin B-complex therapy but that they heal rapidly when the patient is given iron. The lack of response of these lingual changes to therapy with niacin and riboflavin and their subsequent prompt remission after administration of iron is illustrated by the following case report:

M. B., 40 year old colored woman, complained of a sore mouth and tongue and burning of the throat upon swallowing. The symptoms were of 2 months' duration. There had been increased nervousness and easy fatigability for the past year or so. Profuse menstrual bleeding for a 3 week period had occurred 3 years previously and the menstrual periods recently had been 3 weeks apart. History indicated a satisfactory food intake except that meat was eaten infrequently and milk was included only every second day. Examination revealed a tongue with patchy denudation of the papillary tufts, atrophy of the filiform papillae and a glistening surface with some pigmented areas on the left (Figure 1). Except for small uterine fibroids the remainder of the physical examination was non-contributory. Laboratory studies revealed 4.41 million erythrocytes per cu. mm., 10.0 gm. of hemoglobin per 100 ml., and a packed cell volume of 32 per cent. There were 20° of free hydrochloric acid on gastric analysis following histamine stimulation. The symptoms and laboratory findings were unaltered by therapy with 3 mg. riboflavin, 75 mg. niacin, and 9 mg. of thiamine daily for a period of 7 weeks. Therapy was then instituted with ferrous sulfate, 0.3 gm. three times a day. Two weeks later the symptoms of glossitis and the sensitivity of the throat had disappeared and the patient felt less nervous. There was complete regeneration of the lingual papillae and the dorsum of the tongue was covered with the normal papillary tufts (Figure 2). The hemoglobin concentration had risen to 12.0 gm. With continuation of the iron therapy improvement continued, and after 6 weeks of therapy the laboratory findings were: hemoglobin, 12.8 gm.; erythrocyte count, 4.52 million; and packed cell volume, 42 per cent.



FIGURE 1—Tongue of patient M.B. showing denuded surface, atrophy of filiform papillae and visible pigmentation on the side.

In our clinic patients with these oral lesions are more frequently found to be deficient in iron than in B vitamins. Certainly not all patients deficient in iron exhibit these lesions, and there is no question but that such oral lesions are sometimes signs of B-complex deficiency.

With this background there has been tabulated from three nutrition surveys (two in Tennessee<sup>11, 12</sup> and one in North Carolina<sup>20</sup>) the data on incidence of glossitis and/or cheilosis by level of hemoglobin (Table 1). Because of the recognized relationship of adentia and cheilosis<sup>13</sup> the edentulous persons were excluded from the tabulation of the North Carolina data. With full recognition of the small numbers involved in this group, the trend in all of these studies appears to warrant further consideration of iron deficiency as a cause of some of the angular fissures and the glossitis encountered in the surveys of the general population. There are multiple causes of these lesions, one of which is iron deficiency. Obviously, these lesions are nonspecific and the incidence of them alone cannot be used

to estimate the incidence of riboflavin deficiency. Likewise, the presence of the lesions could not be used as a sole measure of iron deficiency within a population.

This example serves to illustrate that epidemiological studies of nutritional problems can be of value in understanding the milder manifestations of deficiencies, provided one adopts a tangible criterion and does not attribute absence of correlations merely to recent changes in dietary intakes.

One word should be said regarding the nature of iron deficiency in adults. This deficiency occurs more commonly in women.<sup>14</sup> It is not of dietary origin, but is due to the conditioning effect of excessive blood loss.<sup>14</sup> Large stores of iron cannot be built up in the body by increasing dietary intakes to protect against such emergencies because the intestinal wall absorbs iron only as the element is required,<sup>15</sup> the dietary excess remains unabsorbed. Because of the quantities involved, effective therapy of

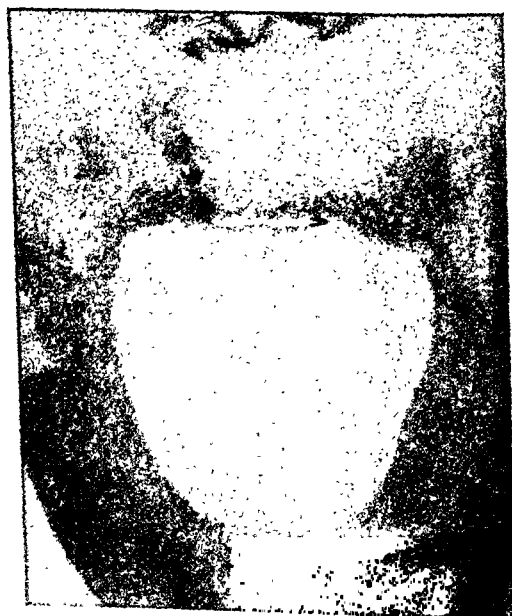


FIGURE 2—Tongue of patient M.B. following therapy with iron. Note complete return of normal epithelium obscuring the pigmentation on the left.

TABLE 1

*The Incidence of Cheilosis and/or Glossitis at Various Hemoglobin Levels, Adults*

Hemoglobin in Grams/100 ml.	Males						Females					
	6.5- 8.9	9.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- 17.9	Total	6.5- 8.9	9.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- 16.9	Total
<i>Tennessee Survey</i> <sup>1</sup>												
Number of subjects with oral signs	..	2	8	16	1	27	1	6	17	3	0	27
Total number of subjects	.	8	75	141	14	238	1	25	111	26	1	164
Per cent with oral signs	.	25	10.7	11.3	7.2	11.3	100	25	15.3	11.5	0	16.4
<i>North Carolina</i> <sup>2</sup>												
Number of subjects with oral signs	1	0	2	0	0	3	0	2	2	0	..	4
Total number of subjects	1	1	35	115	7	159	7	38	147	27	..	219
Per cent with oral signs	100	0	5.7	0	0	1.9	0	5.3	1.4	0	..	1.8

<sup>1</sup> Wilson County and Crossville Surveys, 1939-1941. White and colored population 16 years of age and older. Data made available through the courtesy of Dr. John B. Youmans.

<sup>2</sup> Alamance County, North Carolina, 1943-1944.<sup>2d</sup> White population only, 15 years of age and older. Edentulous subjects excluded.

iron deficiency requires therapeutic doses of iron, not merely iron-rich diets.<sup>14, 16</sup> The problem, then, is one of education of physicians and of women as to when iron deficiency should be suspected. The solution of the problem is not by increasing generally the iron intakes of the healthy members of the population.

In collaboration with Dr. P. F. Hahn and others<sup>17</sup> we have extended our study of iron to an investigation of groups of school children in Nashville, Tenn. In two areas representing the two extremes of the economic scale we have employed for the first time on a mass scale the radioactive iron absorption technic. The findings indicate that iron was not a limiting factor in the hemoglobin levels of these groups of school children age 7-10 years. The mean hemoglobin levels of the children were approximately 13.0 gm. per 100 ml. and the calculated total daily intakes of iron averaged about 11.0 mg., an intake which has been found to be satisfactory by other investigators.<sup>18</sup> This mean hemoglobin level may be considered satisfactory since it is similar to that observed for healthy children in

many other sections of the world,<sup>2f, 25</sup> some of whom were known to be abundantly nourished.<sup>25b</sup> It seems that the arbitrary choice of levels of from 10 to 14 gm. as anemia levels for young children indicative of iron deficiency<sup>19</sup> is not justified. Certainly, hemoglobin levels of 13.5 gm. in children cannot be taken to indicate dietary inadequacy of iron as has sometimes been assumed.<sup>20</sup>

Another recent discovery which may influence the interpretation of nutrition surveys is the demonstration<sup>21</sup> that the deficiency disease, sprue, is relieved by a newly synthesized vitamin variously designated as vitamin M, *Lactobacillus casei* factor, "folic acid," vitamin B<sub>12</sub>, etc. Sprue is a disease characterized by diarrhea with increased fat content of the stools, glossitis, macrocytic anemia, moderate leukopenia, pigmentation of the skin, impairment of gastrointestinal absorption as indicated by a flat oral glucose tolerance curve, a flat vitamin A tolerance curve, a very low serum carotene, a characteristic gastrointestinal pattern on x-ray examination, and striking loss of body weight. Bone marrow studies reveal a maturation arrest in



the megaloblastic phase—a finding similar to that seen in pernicious anemia, nutritional macrocytic anemia, tropical macrocytic anemia, macrocytic anemia of pregnancy, and some other syndromes. The disease is more common in tropical regions, but it occurs endemically in the United States, cases having been reported from many sections of the country. It has long been considered that the disease in non-tropical and in tropical areas is identical and, hence, the entity should not be classified as “tropical” and “non-tropical.”<sup>22</sup>

Because of the similarity of the clinical picture of sprue in man and vitamin M deficiency in the monkey, the demonstration by Day and his coworkers<sup>23</sup> that a purified preparation of *L. casei* factor exhibited vitamin M activity for the monkey, led us to postulate that this vitamin might be efficacious in sprue. In November, 1945, we reported the response of the first cases of sprue to the new synthetic vitamin.\*<sup>21a</sup> This finding was rapidly confirmed and extended.<sup>21b, c, d</sup> We have treated 4 cases of the disease to date and all have shown unmistakable clinical and hematologic response to the synthetic vitamin in doses of 15 to 20 mg. daily. The symptoms of glossitis have disappeared within 3 or 4 days and a rapid regeneration of the lingual papillae has occurred; simultaneously there has been an improved general sense of well-being: the diarrhea has subsided; the appetite has increased to the point of becoming insatiable; and impressive weight gains have followed. One man gained 43 lbs. in 3 months, one woman gained 22½ lbs. within 29 days.

The prompt hematologic response which occurs has been depicted in detail in a previous report.<sup>21b</sup> Increases in all of the formed elements in the blood have been seen and the bone marrow

rapidly loses its primitive character. The platelets have risen from pre-treatment levels of 200,000 or so to post-treatment peaks of 2 to 4 million per cu. mm.

The studies in these patients indicate that this vitamin is concerned with maintaining the normal absorption of the gastrointestinal tract. We noted a return toward normal of the glucose tolerance curves of our patients within a few days after *L. casei* factor was given.<sup>21b</sup> The prompt cessation of the diarrhea, the remarkable weight gains, and the later occurring rise in serum carotene and change in vitamin A tolerance curve<sup>24</sup> all speak for improvement in gastrointestinal absorption by this factor. The effect on appetite is so striking that it is difficult to believe other than that it is a specific result of the therapy. Finally, there is in some cases a decrease in the fecal fat loss expressed in per cent of dry weight of the feces, but a more dramatic decrease in total fat loss due to the decreased quantity of stool. Repeated x-ray examinations of the gastrointestinal tract have not yet permitted a definite conclusion as to the ultimate effect of the vitamin on the “deficiency pattern” which is observed in sprue.

These results indicate that all of the cardinal manifestations of sprue which ordinarily respond to liver extracts respond to this vitamin. That this is but one of a number of active factors in the vitamin M-complex may be surmised from existing evidence. Although the exact pathogenesis of sprue is not clear, it is obvious that at least one number of the vitamin M group, i.e., *L. casei* factor, corrects a deficiency which may exist in man, and it can be assumed that members of this group of substances are required by the human being.

Many questions arise as a result of these studies: Which members of the vitamin group chemically related to *L. casei* factor are effective in man? Is

\*The synthetic *L. casei* factor employed in our studies was kindly supplied by Dr. Stanton M. Hardy, Medical Director, the Lederle Laboratories, Inc.

sprue a simple dietary deficiency? What is the human requirement of *L. casei* factor? Do there exist various degrees of vitamin M deficiency within the population? How does this discovery affect our interpretation of the oral manifestations of deficiency states, of the hematologic findings from nutritional surveys, of the gastrointestinal symptoms and findings which are frequently recorded in nutrition surveys? What is the importance of dietary *L. casei* factor as contrasted to that synthesized by the intestinal flora? Will studies with this new vitamin clarify our understanding of the relationship of sprue, pernicious anemia, nutritional macrocytic anemia, macrocytic anemia of pregnancy, and perhaps pellagra? What precautions should be taken in food processing to avoid destruction of this vitamin? Answers to these questions cannot be provided at this time. It is to be hoped that critical tests will be made of the points raised regarding this vitamin before our enthusiasm for the importance of the dietary supply of this latest factor to be added to those food essentials for man gets ahead of our positive knowledge.

#### CONCLUSION

In conclusion, it is hoped that this discussion has illustrated: (1) that the maintenance of a critical view toward epidemiologic studies in nutrition can, if properly followed, lead to a better understanding of the existing problems in the population, (2) that continued restudy of survey data and revision of our interpretation of such data are necessary in order that we follow sound nutrition practice in designing our public health programs.

#### REFERENCES

- (a) Youmans, J. B., Patton, E. W., and Kern, R. Surveys of the Nutrition of Populations, Description of the Population, General Methods and Procedures, and the Findings in Respect to the Energy Principle (Calories) in a Rural Population in Middle Tennessee. Part 1. *A.J.P.H.*, 32:1371, 1942. *Idem.*, *ibid.* Part 2. 33:58, 1943. (b) Youmans, J. B., Patton, E. W., Sutton, W. R., Kern, R., and Steinkamp, R. Surveys of the Nutrition of Populations. 2. The Protein Nutrition of a Rural Population in Middle Tennessee. *A.J.P.H.*, 33:955, 1943. (c) *Idem.* Surveys of the Nutrition of Populations. 3. The Vitamin A Nutrition of a Rural Population in Middle Tennessee. *A.J.P.H.*, 34:368, 1944. (d) *Idem.* Surveys of the Nutrition of Populations. 4. The Vitamin D and Calcium Nutrition of a Rural Population in Middle Tennessee. *A.J.P.H.*, 34:1049, 1944. (e) *Idem.* Surveys of the Nutrition of Populations. 5. The Vitamin C Nutrition of a Rural Population in Middle Tennessee. *Am. J. Hyg.*, 42:254, 1945.
- (a) Milam, D. F. A Nutrition Survey of a Small North Carolina Community. *A.J.P.H.*, 32:406, 1942. (b) Milam, D. F., and Anderson, R. K. Nutrition Survey of an Entire Rural County in North Carolina. *South. M. J.*, 37:597, 1944. (c) Milam, D. F., and Darby, W. J. The Average Diet of a Southern County and Its Effects on Nutritional Status. *South. M. J.*, 38:117, 1945. (d) Darby, W. J., and Milam, D. F. Field Study of the Prevalence of the Clinical Manifestations of Dietary Inadequacy. *A.J.P.H.*, 35:1014, 1945. (e) Milam, D. F. Plasma Protein Levels in Normal Individuals. *J. Lab. & Clin. Med.*, 31:285, 1946. (f) Milam, D. F., and Muench, H. Hemoglobin Levels in Specific Race, Age, and Sex Groups of a Normal North Carolina Population. *J. Lab. & Clin. Med.*, 31:878, 1946.
- Ivy, A. C. What Is Normal or Normality. *Quart. Bull. Northwestern University Medical School*, 18:22, 1944.
- Dann, W. J., and Darby, W. J. The Appraisal of Nutritional Status (Nutriture) in Humans. With Especial Reference to Vitamin Deficiency Diseases. *Physiol. Rev.*, 25:326, 1945.
- Kruse, H. D. A Concept of the Deficiency States. *Milbank Mem. Fund Quart.*, 20:245, 1942.
- Youmans, J. B., Patton, E. W., Robinson, W. D., and Kern, R. An Analysis of Corneal Vascularization as Found in a Survey of Nutrition. *Tr. Assoc. Am. Physicians*, 57:49, 1942.
- (a) Anderson, R. K., and Milam, D. F. Biomicroscopy of the Eyes in Evaluation of Nutritional Status. Conjunctival Changes. *J. Nutrition*, 30:11, 1945. (b) *Idem.* Biomicroscopy of the Eyes in Evaluation of Nutritional Status. Corneal Vascularization. *J. Nutrition*, 30:17, 1945.
- Darby, W. J. The Oral Manifestations of Iron Deficiency. *J.A.M.A.*, 130:830, 1946.
- Waldenström, J. Iron and Epithelium: Some Clinical Observations. *Acta. med. Scandinav.*, supp. 90:380, 1938.
- Vinson, P. P., and Schmidt, H. W. Hysterical Dysphagia: Report of a Typical Case. *Virginia M. Monthly*, 64:142, 1937.
- Hahn, P. F., Jones, E., Lowe, R. C., Meneely, G. R., and Peacock, W. The Relative Absorption and Utilization of Ferrous and Ferric Iron in Anemia as Determined with the Radioactive Isotope. *Am. J. Physiol.*, 143:191, 1945.
- Youmans, J. B. A Nutritional Survey in Crossville, Tennessee. Personal communication.
- Ellenberg, M., and Pollack, H. Pseudo Ariboflavinosis. *J.A.M.A.*, 119:790, 1942.
- Heath, C. W., and Patek, A. J., Jr. The Anemia of Iron Deficiency. *Medicine*, 16:267, 1937.
- Hahn, P. F., Bale, W. F., Lawrence, E. O., and Whipple, G. H. Radioactive Iron and Its Metabolism in Anemia. *J. Exper. Med.*, 69:739, 1939.
- Youmans, J. B. *Nutritional Deficiencies*. 2nd ed. Philadelphia: Lippincott, 1943, pp. 257-282.
- Darby, W. J., Hahn, P. F., Kaser, M. M., Steinkamp, R. C., Densen, P. M., and Cook, M. B. The Absorption of Radioactive Iron by Children 7-10 Years of Age. *J. Nutrition*, 33:107, 1947.

18. Oldham, H., Roberts, L. J., and Young, M. Results of Providing a Liberally Adequate Diet to Children in an Institution. III. Blood and Urinary Excretion Studies Before and After Dietary Improvement. *J. Pediat.*, 27:418, 1945.
19. Committee on Diagnosis and Pathology of Nutritional Deficiencies, Food and Nutrition Board. Inadequate Diets and Nutritional Deficiencies in the United States. *Bull. National Research Council*, No. 109, 1943, pp. 25-26.
20. Pierce, H. B., Fenton, P. F., Wilkins, W., Newland, M. E., and Budge, P. S. Nutritional Defects Among Children in Vermont. *New England J. Med.*, 233:612, 1945.
21. (a) Darby, W. J., and Jones, E. Treatment of Sprue with Synthetic *L. casei* Factor (Folic Acid, Vitamin M). *Proc. Soc. Exptl. Biol. & Med.*, 69:259, 1945. (b) Darby, W. J., Jones, E., and Johnson, H. C. Effect of Synthetic *Lactobacillus casei* Factor in Treatment of Sprue. *J.A.M.A.*, 130:780, 1946. (c) Moore, C. V., Bierbaum, O. S., Welch, A. D., and Wright, L. D. The Activity of Synthetic *Lactobacillus casei* Factor ("Folic Acid") as an Antipernicious Anemia Substance. *J. Lab. & Clin. Med.*, 30:1056, 1945. (d) Spies, T. D., Lopez, G. G., Menendez, J. A., Minnich, V., and Koch, M. B. The Effect of Folic Acid on Sprue. *South. M. J.*, 39:30, 1946.
22. Hanes, F. M. Sprue. *Tice's Practice of Medicine*, Vol. IV. Hagerstown: W. F. Prior Company, Inc., 1943.
23. Day, P. L., Mims, V., Totter, J. R., Stokstad, E. L. R., Hutchings, B. L., and Sloane, N. H. The Successful Treatment of Vitamin M Deficiency in the Monkey with Highly Purified *Lactobacillus casei* Factor. *J. Biol. Chem.*, 157:423, 1945.
24. Darby, W. J., Kaser, M. M., and Jones, E. The Influence of Pteroylglutamic Acid (a member of the Vitamin M Group) on the Absorption of Vitamin A and Carotene by Patients with Sprue. *J. Nutrition*, 33:243, 1947.
25. (a) Committee on Haemoglobin Surveys, Medical Research Council. Haemoglobin Levels in Great Britain in 1943 (with Observations Upon Serum Protein Levels). *Special Report Series No. 252*. London: Medical Research Council, 1945. (b) Macy, I. G. *Nutrition and Chemical Growth in Childhood*. Vol. II. Springfield: Thomas, 1946, p. 1406. (c) Pett, L. B., Hanley, F. W. and Perkins, E. Hemoglobin Levels of Children in British Columbia. *Bull. Vancouver Med. Assn.*, 22:128, 1946.

# Are Frozen Foods a Public Health Problem?\*

GERALD A. FITZGERALD

*Director, Frozen Food Foundation, Inc., Syracuse, N. Y.*

AS we become better acquainted with the history of peoples of frigid areas, we learn that food preservation by freezing has been practised perhaps for thousands of years through natural climatic action. Creating refrigeration by artificial means in warmer climates, however, is a comparatively recent development.

Starting with Dr. William Cullen in Scotland in 1820, who invented a sulfuric acid refrigerating apparatus for cooling biologicals, advances in mechanical refrigeration were slow. Salt and ice freezing mixtures were satisfactory only for local uses. Linde in Germany, in the middle 1800's made the first practical contribution with the introduction of the expanded air machine. Milwaukee became the center of the beer industry largely because Vilter made his ammonia refrigerating machines there. Fish was frozen commercially with mechanical refrigeration, using ammonia in 1891 at Sandusky, Ohio. Although this was the first commercial venture using mechanical refrigeration, it was preceded by ice and salt freezing of fish in 1861, poultry in 1865, and meats in 1880. Frozen fruits were introduced in 1905, vegetables in 1930, precooked entrees in 1942, and bakery products about a year later.

## THE FLORA OF FROZEN FOODS

Sanderson and Fitzgerald<sup>1</sup> presented a paper at the Third International Congress of Microbiology in 1939, "The Bacteriological Flora During Spoilage of Frozen Vegetables," which was never published in full. The facts are herewith presented because this information should receive wider notice and because no similar studies of this nature have since appeared. They confirmed the work of others that the usual flora of frozen vegetables consisted of members of the genera: *Achromobacter*, *Aerobacter*, *Bacillus*, *Chromobacterium*, *Flavobacterium*, *Lactobacillus*, *Micrococcus*, *Phytomonas*, *Pseudomonas*, *Sarcina* and *Serratia*. The above organisms had usually been isolated from frozen or freshly defrosted and not from spoiled frozen foods. The study of the latter presents quite a different picture.

Prescott and Geer<sup>2</sup> had suggested inoculating frozen foods with an acid-forming organism as a safety factor to produce acid and thus spoil the product through souring before the toxigenic types could produce an enterotoxin. Berry (1933)<sup>3</sup> had discovered that after seven days at room temperature, frozen peas yielded *Lactobacilli* as the predominant organism.

In the Sanderson-Fitzgerald study, spoilage at 10, 21, and 32° C. was investigated. Ten gram samples were taken and all were incubated at 25° C. for 72 hours. The earlier stages of de-

\* Presented before the Food and Nutrition Section of the American Public Health Association, at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 14, 1946.

composition disclosed an unexpected rise in pH in which the decomposition products had a somewhat sulfuretted (H<sub>2</sub>S) quality. However, at 21° and 32° C., a sudden drop in pH usually occurred during spoilage in 11 to 13 hours.

In the soured products, only *Flavobacterium* and *Micrococcus* predominated repeatedly. Yet experience indicated that neither of these types was capable of producing acid in such quantities or so rapidly as was occurring in the samples of corn, peas, and spinach being investigated. It was quite evident that the Bacto-nutrient agar being used was not a satisfactory medium for such a study.

With the thought that streptococci might be implicated, a streptococcus medium of Pabulum infusion agar was tried. Immediately, counts increased tenfold. Using special streptococcus media, streptococci were consistently found to be the cause of souring asparagus, peas, wax and green beans, and corn which had been frozen in factories located in widely scattered parts of the United States. The remainder of the investigation consisted of an attempt to identify the causative organism. Dr. C. P. Hegarty of Oregon State College and Dr. B. E. Proctor of Massachusetts Institute of Technology cooperated in the identification studies.

The consensus was that one and possibly two strains of *Streptococcus faecalis* were responsible. Moreover, an attempt

to discover the source led to the fact that the same organism could be removed aseptically from within the seed coats of peas and kernels of corn. Thus, the apparent connection between the acid producing organism described and the *Enterococci* is difficult to explain.

The rapid souring of frozen vegetables may be nature's way of protecting the frozen-foods-eating public. It is hoped that similar work will be undertaken by others because of uncertainty with respect to the causative organism. For the purpose of assisting others to continue this work, Chart 1 is presented to show the biochemical differentiation of two strains of an organism presumed to be *Streptococcus faecalis* as determined in the above mentioned investigation. It should be noted that several of the streptococcus strains isolated differed in certain characteristics. The majority of the cultures failed to ferment lactose even after 2 weeks' incubation. One group failed to grow at 10° C.

In summarizing the work reported, it is evident that the bacteriological flora of frozen foods is very extensive, but of great significance is the apparent presence of certain very active acid producing types so that toxigenic or pathogenic types may be entirely inhibited during the spoilage process. This presumption remains to be unequivocally proved. As yet, therefore, one cannot avoid consideration of the implications of *Clostridium botulinum*,

CHART 1

BIOCHEMICAL DIFFERENTIATION OF TWO STRAINS OF *Streptococcus faecalis*

	Growth in Presence of										Acid Produced from									
	10° C.	21° C.	32° C.	5% NaCl	pH 2.0-3.0	0.5% Meth. Blue	Strong Reduction	Survived 60° C., 30 min.	NH <sub>3</sub> from Peptone	Starch Hydrolyzed	Gelatin Liquefied	Glucose	Sucrose	Lactose	Maltose	Trehalose	Mannitol	Inulin	Sorbitol	Salacin
Str. 1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Str. 2	-	+	+	+	+	+	+	+	+	-	-	+	+	+	+	+	+	-	+	+

\* Str. 2 still grows at 10° after two weeks.  
† In Str. 2, cultures only those have shown acid production at two weeks.

*Staphylococcus aureus*, the Enterococci and Salmonella and other pathogenic types which may contaminate frozen foods.

#### EPIDEMIOLOGY OF FROZEN FOODS

From the start, public health minded food technologists worried about the implications of botulism, *Staphylococcus* food poisoning, and pathogenic manifestations resulting from the unregulated production and use of frozen foods. As yet, such fears have not materialized in spite of the fact that one or another of these foods has been marketed commercially in ever-increasing amounts from sources in every section of the country for many years.

Large-scale output of frozen meats, in effect, dates from the publication in 1898 of a report<sup>4</sup> by the British Society of Public Analysts giving that product a good nutritional rating. The meat industry has been very careful in freezing meat, and consequently it has caused no health problems either in the United States or abroad.

Despite rather extensive shipments of frozen fish, only one reference has been found on sickness caused specifically by this product. Unfrozen shellfish have long been recognized as potential health hazards.

Epidemiology of frozen desserts has received much study. Without doubt, the control experience gained by investigators in this field will be of great significance in establishing sanitary measures for the newer phases of the frozen food industry, particularly frozen precooked products. It is significant that the American Public Health Association has taken the lead in proposing tentative methods<sup>5</sup> for the microbiological examination of frozen foods.

Frozen strawberries have been marketed for soda fountain purposes since 1905. It was early found that their high acidity was responsible for the

sterilizing action which occurs during long-term freezing storage.

Frozen vegetables, however, have been generally regarded as potential public health hazards because of their practically neutral state. As a result, several serious studies were made during the early '30's.

Prescott and Geer<sup>2</sup> dispelled fear of botulism from frozen vegetables in work which was published in 1936. Their studies, as well as those of Meyer, Tanner, James, and others, indicated that spores of *Clostridium botulinum* resisted freezing, but no toxin was produced at refrigerator temperatures after defrosting for several days, and that there was little or no danger of botulism from frozen foods which were properly handled. However, they have implied that when improperly handled either in plant or kitchen, frozen vegetables may cause trouble.

Jones and Lockhead,<sup>6</sup> Dack,<sup>7</sup> and others who have studied *Staphylococcus* food poisoning extensively imply that frozen cooked foods and bakery products might contain public health hazards based on the epidemiology of their unfrozen counterparts. While many investigators now may be investigating such possibilities, the literature contains hardly a case of authenticated food poisoning directly caused by bacterially contaminated frozen foods prepared commercially for sale to the retail and institutional trades. Despite this, evidence may be accumulating to change the situation. It is important, therefore, to study the bacteriological picture thus far presented in the literature.

#### BOTULISM INVESTIGATIONS

Dack<sup>7</sup> says that botulism is a disease due to an enterotoxin formed by the growth of botulinum microorganisms which, after the symptoms appear, has produced physical damage often resistant to specific antitoxin therapy.

In the early days of the canning in-

dustry botulism was a serious obstacle to the growth of the industry. One laboratory has spent 26 years on this project which is not yet finished. Accordingly, there is no longer any fear of botulism from foods *commercially* canned in tin or glass because of safety factors used. Nevertheless only during the recent world war was the botulinum enterotoxin isolated and identified. Being a protein, giving the usual protein reactions, its identification has not yet proved of specific practical value.

Although *commercially* canned foods are no longer implicated in botulism outbreaks, home canned foods are continually causing sickness and death even though federal and state governments have spent millions in educating the public about home canning methods. It may be that conversion from home canning to home freezing may automatically eliminate botulism as a grave public health hazard.

The previously described work of Prescott and Geer,<sup>2</sup> Tanner,<sup>8</sup> Meyer, and others has given experienced investigators confidence that frozen foods do not present any more serious botulinum, food poisoning problems than do fresh foods. Dr. K. F. Meyer probably expressed the group thinking in this recent statement to the writer: "My epidemiological experience with frozen foods indicates that frozen fruits and vegetables do not constitute a health hazard in so far as botulism is concerned."

#### STAPHYLOCOCCUS FOOD POISONING INVESTIGATIONS

Work with human beings and animals shows that various subjects, and even the same subject at different times, react differently to the same dose of the enterotoxin. Accordingly, the only sound evidence that frozen foods can be the source of *Staphylococcus* food poisoning would be actual epidemics unequivocally proved to be caused by such foods.

Jones and Lockhead<sup>9</sup> found that of

fifty strains of *Micrococci* isolated from frozen vegetables, twelve were able to produce an enterotoxic substance. They also found that of eighteen strains of *Staphylococci* capable of elaborating enterotoxic substance in pure culture in semi-solid starch medium, only eight were able to produce this in frozen corn defrosted 24 hours at room temperature (20° C.); but these eight were unable to produce enterotoxin in a refrigerator at 4.4° to 10° C., where no multiplication of *Staphylococci* was observed. Segalove and Dack<sup>9</sup> conducted temperature incubation studies and found that below 4.0° C. (40.1° F.) the toxin was not formed after 4 weeks' incubation. Monkeys were used in these tests.

McCastline, Thompson, and Isaacs<sup>10</sup> describe an outbreak of *Staphylococcus* food poisoning due to ice cream custard. Tanner<sup>8</sup> describes an outbreak which was traced to frozen fish. Rumors of outbreaks in Army and Navy camps from frozen eggs and other products are not well authenticated.

Considerable additional evidence is needed to support a case for or against *Staphylococcus* food poisoning from frozen foods. The first attempt to get down to fundamentals is the proposal of a committee, composed of leaders of various types of food trade organizations, to set up a fund with which to conduct basic studies in *Staphylococcus* food poisoning. Even though frozen foods are not definitely major offenders, the frozen food industry has every reason to cooperate in such studies to the fullest extent.

Frozen precooked foods such as chicken a la king may potentially be sources of *Staphylococcus* food poisoning. One can easily visualize the contamination which may take place in hand-picking poultry meat from cooked chicken. One can also visualize the difficulty of sterilizing such meat without re-cooking. A person having a boil or other festering sore, or a cold or other

similar infection, might cause the contamination, since toxigenic *Staphylococci* may be present. When such highly contaminated meat is combined with starch, milk, or egg-thickened cream sauce and frozen it is quite impossible to avoid the resulting bacteriological contamination no matter how careful, clean, or well regulated the operation may be otherwise. Spoilage of such a product at room temperature would probably be necessary to cause sickness, however, because Lockhead and Jones<sup>6</sup> indicated the toxin cannot be elaborated while the food is refrigerated.

Our knowledge of the *Staphylococcus* enterotoxin indicates that it is heat-stable, and will withstand boiling for 10 minutes. If present in a product it is certain to cause trouble. Fortunately, it is not so fatal a toxin as that which causes botulism, but it is serious enough to warrant the costly research which its study, control, and prevention will require.

The fact that frozen precooked entrées and baked goods are usually reheated before serving presents an excellent opportunity to sterilize these products. Gilcreas and Coleman<sup>11</sup> determined that *Staphylococci* in custard filling are rendered non-viable in 15 minutes at 430° F., and in 20 minutes at 420° F. It is estimated that such treatment should free the material of toxigenic organisms.

Cathcart and Merz<sup>12</sup> discovered that the presence of chocolate and cocoa inhibited enterotoxin production in the absence of eggs. They also advocate boiling the custard<sup>13</sup> twice to eliminate persistent types of *Staphylococci* and *Salmonella*. Roberts and Wilson<sup>14</sup> claim that daily examination of workers for sores and head colds will help to avoid introducing *Staphylococcus* organisms during preparation of frozen foods, and they strongly advocate regulations for the care and handling of

cream fillings during and after preparation. These precautions should be heeded by producers of frozen precooked foods and bakery items.

#### PATHOGENIC ORGANISMS

While English investigators indicate that certain strains of *Salmonella* may produce enterotoxic substances, this has never been shown in American laboratories. Accordingly, *Salmonella* are considered as only pathogenic and not toxigenic in the following discussion. Because of the serious illness which may be caused by these organisms, the aim of the producer of frozen foods must be to eliminate entirely the possibility of the product becoming contaminated by germs of human origin.

*Salmonella* is the most important cause of diarrheal diseases according to Rubenstein, Feemster, and Smith,<sup>15</sup> who found that four types of *Salmonella* were responsible for 70 per cent of 811 cases investigated. Although all age groups were involved, children were most susceptible. Convalescents and permanent carriers are frequently the cause of food infection with *Salmonella* organisms.

Segalove and Dack,<sup>16</sup> after inoculating *Salmonella enteritidis* experimentally into string beans, tomato juice, peaches, shrimp, salmon, corn, spinach, and peas, and incubating them at 22° and 37° F., noted unexpectedly that better growth occurred at the lower temperature.

Ostrolenk and Welsh<sup>17</sup> proved that *Salmonella* contaminated food may be the source of infection carried to other foods and water by means of flies. They showed that flies carried viable organisms as long as 4 weeks. Moreover, the fly passes the organism on to succeeding generations by infecting its eggs.

Food handlers were shown to be the major source of *Salmonella* poisoning in a study conducted by W. S. Stone<sup>18</sup> who found 44 *Salmonella* carriers and 5



Shigella carriers out of 2,000 food handlers. These handlers, generally asymptomatic themselves, were associated with several small epidemic outbreaks.

Army investigators<sup>19</sup> discovered that carriers of *Salmonella oranienberg* can be successfully treated with sulfaguanidine. Therefore, examination of handlers is not merely academic since such sources can be eliminated through positive therapeutic action.

Although the Kaufman-White<sup>20</sup> test has been used as an objective method of differentiating non-pathogenic and pathogenic strains of *Salmonella* by Edwards<sup>21</sup> and others, the question of whether *Salmonella* of animal origin are pathogenic to man has not yet been answered. Investigators have always considered this as a possibility, but no direct evidence has ever been found to prove it. However, studies have described an outbreak of *Salmonella* infection allegedly derived from internally contaminated chicken eggs.

There have been certain indications that *Salmonella* organisms not only survive freezing storage but remain sufficiently viable to cause gastrointestinal infections, but there is a question that this is possible. The frozen food industry should attempt to prove this beyond any doubt.

The Enterococci and other gastrointestinal bacilli may or may not be implicated in food infections from frozen foods since direct evidence appears to be lacking. However, the protection of spoilage usually associated with food intoxications does not apply against infections, and extreme precautions against contamination are necessary.

#### INDUSTRIAL CONTROL PROCEDURES

The frozen food industry thus far has failed to establish a sanitary code to protect itself and its customers. A committee of the A.P.H.A. has recommended using the M.P.N. (most prob-

able number)<sup>5</sup> or/and <sup>22</sup> value as a measure of human contamination of frozen foods. Various states have established sanitary codes for shellfish and in such foods the raw products are controlled to some extent.

The writer has felt that an industry standard of 100,000 organisms per gm. incubated on tryptone glucose extract agar for 72 hours at 30° C. might be difficult to maintain. After he saw a plant which can handle more than a million pounds daily of some products, meeting a standard of 10,000 per gm., he feels firmly convinced that the industry can set up the above standard for fruits, vegetables, meats, fish, and poultry, and an objective of 250,000 per gm. on hamburger, sausage, and similar products. Furthermore the direct count method such as that of Breed<sup>5</sup> and/or <sup>23</sup> on milk should be used as an additional standard to determine the original condition of raw materials for all products processed by heat prior to freezing. A standard microscopic count of 1,000,000 per gm. or ml. should be considered maximum.

Simultaneously, contamination with organisms of human intestinal origin should be measured against a standard. A maximum M.P.N. value of 100 may seem high for most products. In shellfish<sup>24</sup> a value of 230 is interpreted as indicative of unfavorable conditions.

#### SUMMARY

Frozen foods have been remarkably free from suspicion of being health hazards both as to enterotoxic food poisoning and infectious diseases. An acid-forming streptococcus appears to be an active factor during spoilage, souring foods beyond edibility before enterotoxins can be elaborated. However, there is considerable possibility that pathogenic organisms may survive the freezing-storage treatment and retain sufficient viability to cause infectious diseases. These could be a source of

infection in frozen foods of the very best quality because the souring would not be present to warn the user. Frozen fruits and vegetables which may be served in raw salads, could very well be the source of infections. These can be controlled only through careful sanitary procedures in factories.

Laboratory methods of detecting the incidence of toxigenic or pathogenic strains of organisms are presently inadequate, and frozen foods may momentarily be implicated as health hazards. The industry, accordingly, has every reason to support thorough research designed to develop control techniques.

It is difficult without human test subjects to show through laboratory studies the effect of freezing, time of storage, type of substrate or growing medium, temperature of storage and other factors upon the viability of known toxigenic and pathogenic microorganisms, relative to production of enterotoxins and to pathogenicity. While the frozen food industry is at least no worse off in this regard than other food industries, as a relatively new development it could be very seriously affected should a major epidemic be laid at its door.

A review of the foregoing should not make the frozen food industry feel more secure, but rather should encourage it to accept the responsibility for increasing the scope of research devoted to solving the several important problems outlined.

**ACKNOWLEDGMENT**—The writer wishes to express grateful acknowledgment of the assistance of Miss Ruth Adamy in searching the literature on the subjects of Botulism, Staphylococcus food poisoning, and Salmonella infectious outbreaks.

#### REFERENCES

1. Sanderson, N. H., and Fitzgerald, G. A. Bacteriological Flora During Spoilage of Frozen Vegetables. 3rd Int. Congress for Microbiology. *Report of Proceedings*, New York, 1940, p. 710.
2. Prescott, S. C., and Geer, L. P. Food Poisoning Organisms under Refrigeration Conditions. *Refr. Eng.*, 32:211-212, 1936.
3. Berry, J. A. Lactobacilli in Frozen Pack Peas. *Science*, 77:350-351, 1933.
4. The Nutrient Qualities of Frozen Meat. *Lancet*, 1898, I, p. 692.
5. Goresline, H. E. Microbiological Examination of Foods. Tentative Methods for the Microbiological Examination of Frozen Foods. *A.J.P.H.*, 36:332-335, 1946.
6. Jones, A. H., and Lockhead, A. G. A Study of Micrococci Surviving in Frozen-Pack Vegetables and Their Enterotoxic Properties. *Food Research*, 4:203-216, 1939.
7. Dack, G. M. *Food Poisoning*, Chicago: University of Chicago Press, 1944.
8. Tanner, F. W. *Microbiology of Foods*, 2nd Ed. Champaign: Garrard Press, 1944.
9. Segalove, M., and Dack, G. M. Relation of Time and Temperature to Growth and Enterotoxin Production of Staphylococci. *Food Research*, 6:127-133, 1941.
10. McCastline, W. B., Thompson, R., and Isaacs, M. L. A Food Poisoning Outbreak Due to Staphylococcus. *J. Bact.*, 33:50-51, 1937.
11. Gilcreas, F. W. and Coleman, M. B. Studies of Rebaking Methods for Cream-Filled Pastries. *A.J.P.H.*, 31:956-958, 1941.
12. Cathcart, W. H. and Merz, A. Staphylococci and Salmonella Control in Foods. III. Effect of Chocolate and Cocoa Fillings on Inhibiting Growth of Staphylococci. *Food Research*, 7:96-99, 1942.
13. Cathcart, W. H., Merz, A. and Ryberg, R. E. Staphylococci and Salmonella Control in Foods. IV. Effect of Cooking Bakery Custards. *Food Research*, 7:100-103, 1942.
14. Roberts, J. and Wilson, R. J. A Third Outbreak of Staphylococcal Food Poisoning in Hamilton, Ontario. *Canad. Pub. Health J.*, 30:590-598, 1939.
15. Rubenstein, A. D., Feemster, R. F. and Smith, H. M. Salmonellosis as a Public Health Problem in Wartime. *A.J.P.H.*, 34:841-853, 1944.
16. Segalove, M. and Dack, G. M. Growth of a Strain of *S. enteritidis* Experimentally Inoculated into Canned Foods. *Food Research*, 9:1-5, 1944.
17. Ostrolenk, M. and Welsh, H. The House Fly as a Vector of Food Poisoning Organisms in Food Producing Establishments. *A.J.P.H.*, 32:487-494, 1942.
18. Stone, W. S. Food Handlers in the Army and Their Relationship to Salmonella Food Poisoning. *A.J.P.H.*, 33:706-708, 1943.
19. Stewart, J. K. and Slack, J. M. Salmonella Food Poisoning. *Bull. U. S. Army Med. Dept.*, 88:120-122, 1945.
- 20a. Galton, M. M. and Quan, M. S. Salmonella Isolated in Florida during 1943 with the Combined Enrichment Method of Kauffman. *A.J.P.H.*, 34:1071-1075, 1944.
- 20b. Kauffman, F. *Die Bakteriologie der Salmonella Gruppe*. Copenhagen: Einar Munksgaard, 1941.
21. Edwards, P. R. and Hughes, H. A New Salmonella Type with Hitherto Undescribed Somatic Antigens. *Proc. Soc. Exper. Biol. & Med.*, 56:33, 1944.
- 22a. Amer. Public Health Assoc. and Am. Water Works Assoc. *Standard Methods for the Examination of Water and Sewage*, 9th Ed. A.P.H.A., 1946.
- 22b. Gibbard, J. Bacteriological Examination of Shellfish and Shellfish Waters. *A.J.P.H.*, 33:582-591, 1943.
23. Amer. Public Health Assoc. and Assoc. Off. Agric. Chemists. *Standard Methods for the Examination of Dairy Products*. 8th Ed. A.P.H.A., 1941.
24. U. S. Public Health Service. *A Manual of Recommended Practice for the Sanitary Control of the Shellfish Industry*, Sept. 1, 1944.

## Current Trends in Nutrition Research in Canned Foods\*

R. W. PILCHER, PH.D., AND B. S. CLARK, D.Sc.

*Research Division, American Can Company, Maywood, Ill.*

FOR more than 25 years reports in the literature have dealt with various phases of nutrition research on canned foods. Most of these reports group themselves into three distinct patterns of research. In the first of these may be classed those studies seeking to establish the nutritive values of commercially canned foods with particular reference to their vitamin contents. The second pattern includes investigations designed to establish the effects of conventional canning procedures or operations on vitamins present in raw foods. The third pattern comprises studies devoted to establishment of the stability of vitamins in canned foods during storage or usage. Investigations of these three general types have significant public health implications because in the ultimate analysis they relate to the improvement of the nutritive quality of canned foods as consumed by the American public.

The importance of these several patterns of investigation is further reflected by the fact that they have constituted the main fabric of the current nutrition program on canned foods jointly sponsored by the National Canners Association and the Can Manufacturers Institute. This program, which has been elsewhere described,<sup>1</sup> was conceived

prior to Pearl Harbor and inaugurated during the first year of the recent war. The National Defense Program of 1941 created a demand for more complete information on the nutritive values of canned foods and provided the direct stimulus for later inauguration of the program. In 1942, the wartime need for such data developed a high degree of coöperation between industry and educational institutions with the end result that an impressive volume of information on the nutritive values of canned foods was rapidly accumulated during the war years. The data thus far published as a result of this program will be considerably amplified by the end of 1947 through publication of the results of studies recently completed or currently in progress.

It is anticipated that work in these three phases of nutrition research will continue for some years to come, despite the great advances in knowledge made during the war, because of the sustained interest in these fields on the part of various laboratories associated directly or indirectly with the canning industry. However, during recent years our laboratory has engaged in specialized activities within these phases which were prompted either by new processing or equipment developments or by new interests arising as a result of the operations of the National Canners Association-Can Manufacturers Institute program. It is the purpose of this report to describe briefly several of the more

\* Presented before the Food and Nutrition Section of the American Public Health Association at the Seventy-fifth Annual Meeting in Cleveland, Ohio, November 12, 1946.

important of these new departures which have concerned our laboratory during the past several years. In particular, projects which appear to have an ultimate public health importance have been selected for discussion.

#### EVALUATION OF MANUFACTURING OPERATIONS

In the investigations made under the NCA-CMI program, the 1942 and 1943 studies dealt chiefly with the vitamin values of commercially canned foods as manufactured, and with the effect of conventional canning operations on vitamins in raw canning stocks. These studies were carried out by extensive surveys of commercial plants and products. The findings suggest that, in general, those foods which were significant providers of certain vitamins in the raw state were also significant contributors of those same vitamins in the final canned product.<sup>1</sup> Tests on the effects of canning operations on vitamins in raw canning stocks have shown that the extent of the effect varies with the nature of the product and with the vitamin under consideration. Moore, et al.,<sup>2</sup> Wagner and Associates,<sup>3</sup> and Lamb<sup>4</sup> have found that the degree of retention of ascorbic acid in canned citrus products is consistently high during conventional canning. However, as indicated by other reports,<sup>5,7</sup> vitamin retentions in the case of certain other standard canned food commodities showed a considerable degree of variability, with particular reference to ascorbic acid. The more important reasons for these variations in ascorbic acid, which in the case of certain items approached the tenfold value, have been reviewed by Jackson, et al.,<sup>8</sup> and by Feaster and Alexander.<sup>6</sup>

For nearly ten years, field surveys of canning operations had largely been conducted as a result of the interest of laboratories connected with the industry rather than as the result of the practical interest of canners. As notable excep-

tions, of course, must be noted those manufacturers producing special purpose foods or foods exceptionally high in specific nutrients, or those seeking A.M.A. Council on Foods and Nutrition acceptance for their products. However, publication of the early results of work in the NCA-CMI program led to an awakened interest on the part of canners as to the efficiency of their own operations since, for the first time, a basis of comparison for the products of the industry as a whole was available. Canners whose products or plants had not been included in the studies desired to know how their products or operations compared with those reported; others sought to learn how existing operations might be improved so as to place their products in a more favorable position with respect to vitamin values or vitamin retention. Interest was particularly manifest in ascorbic acid because of the A.M.A. Council on Foods and Nutrition requirement for a minimum vitamin C value in Council-approved ascorbic acid carriers. An increased number of requests from canners for field surveys of factory operations have therefore been received by many laboratories associated with the industry.

In Table 1 are shown results typical of many of those obtained in such field surveys. The three plants listed were operated by one manufacturer; the canning lines surveyed were of conventional types differing only in detail; the basic equipment, operations and supervision were of one general pattern. While all samples assayed can be considered significant sources of ascorbic acid, variations in the per cent retentions, even in the same plant, are wide. In these particular instances, the occasional slow speed of cannery operations was the major factor influencing low ascorbic acid retention. Variations in vitamin C retention of from 52 to 80 per cent in tomato juice canning operations have

TABLE 1  
*Ascorbic Acid Retention in Tomato Juice During Canning*

Plant	Survey Number	Content Mg./100g.	Ascorbic Acid	
			Retention * Per cent	Per cent Daily Allowance † 100 Gram Portion
1	1	18.2	81	24
	2	14.8	67	20
	3	18.4	69	25
2	1	12.3	54	16
	2	13.7	52	18
3	1	9.4	44	13
	2	12.5	61	17

\* Based on chopped tomatoes

† Based on 75 mg. daily adult allowance

been described by Guerrant, et al.<sup>7</sup> Results of 1943 and 1944 surveys conducted by Lamb<sup>9</sup> showed ever greater deviations, namely, 32 to 94 per cent.

It has become clearly apparent that much may be accomplished toward improved vitamin retention merely by more effective operation of existing equipment. Surveys such as the one described have proved convincing to practical cannery management. Likewise effective has been expression of the results in terms of the percentage of the daily vitamin requirement supplied by convenient portions of the final product. Such a method of expression translates improvements in operations directly into an understandable benefit to the consumer which will accrue from such improvements. In this way, the basic reason for effective operations is made more apparent, much more so than simple statement of the findings showing vitamin content on a percentage or on a volume or weight basis. Sustained surveys of this type over several years should result in distinct raising of nutritive quality levels in many canned foods.

#### EVALUATION OF NEW HEAT PROCESSING TECHNIQUES

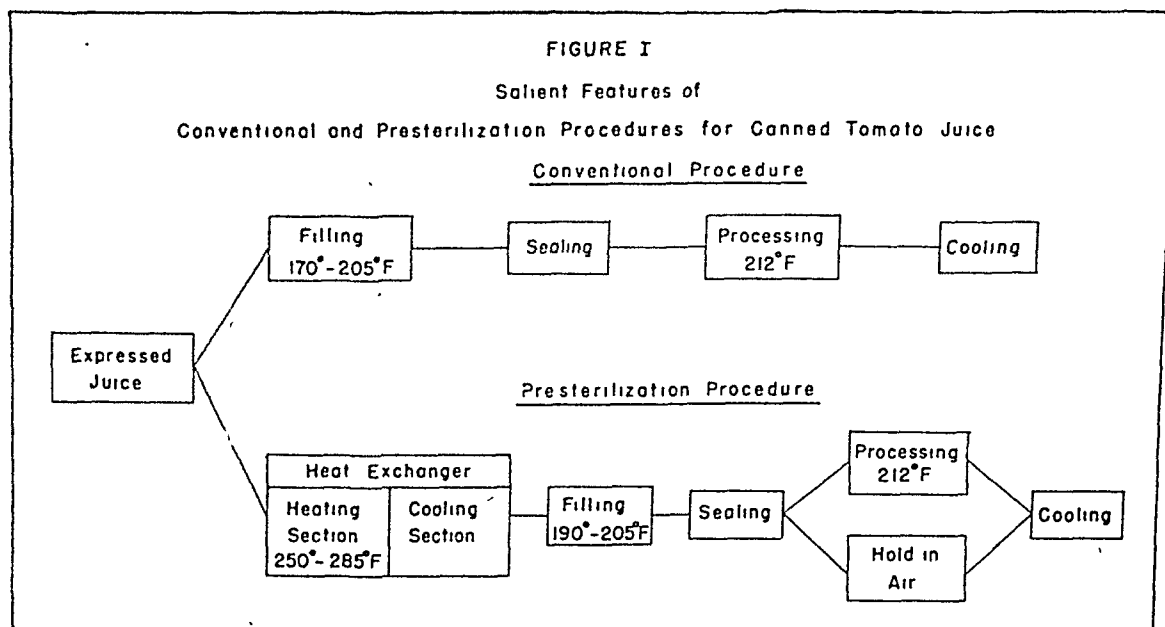
During recent years, there have been several important practical applications of new heat processing techniques. It should be frankly stated that these developments have come about more

from interest in improved organoleptic quality in the final product or improved control of operations than from the consideration of improved vitamin retention. Whatever the initial purposes of the developments, study of these new techniques from the nutrition standpoint represents a new trend of investigation, and the results of several of these studies may be of interest here.

#### PRESTERILIZATION OF ACID VEGETABLE JUICES

For a number of years, sporadic spoilage has been experienced by canners of tomato juice or vegetable juices consisting largely of tomato juice, due to heat resistant spore-forming organisms capable of causing the "flat sour" type of spoilage. As made clear by Pearce<sup>10</sup> and by Williams,<sup>11</sup> the heat process commonly employed in the conventional canning procedures will not prevent spoilage due to such organisms, and their control depends upon observance of strict precautions in the plant.

As a result of work begun in 1940, Wessel and Benjamin of this laboratory suggested in 1941 a new means for process control of these organisms, which has now come into widespread commercial use.<sup>12</sup> In this new processing technique, the juice is heated by pumping through a suitable type of heat interchanger to temperatures in the range of 250° to 285° F., and is held at the elevated temperature for a few seconds



in order to effect the desired sterilization, and is then cooled and filled into cans at temperatures between 190° and 205° F. The sealed cans are inverted or are given a short boiling water process to sterilize the top can end and water cooled. The first commercial installation for this new so-called presterilizing or "flash" processing technique was made in 1941, but in 1946 more than 50 such installations were in commercial operation with complete success. The quality of the juices subjected to this high temperature—short time sterilizing process or flash process is entirely comparable to juice packed by the conventional process. Figure I shows schematically the salient differences between the conventional and the new flash processing methods for tomato juice.

Commercial use of the presterilizing process raised the question of whether it would favor greater retention of vitamins, particularly of thiamin, in the acid products for which it is used than does the conventional procedure, since high-short processing has been found to favor vitamin retention in certain low-acid products.<sup>8</sup> Work in 1944 and 1945, however, suggests that the ranges of thiamin and of ascorbic acid

retention in tomato juice are practically identical for both procedures and that any major differences found in the overall procedures may be ascribed to factors other than time and temperature of processing. Data on thiamin retention during flash and conventional heat processing operations are shown in Table 2.

TABLE 2

*Thiamin Retention in Tomato Juice*  
*Effects of Flash and Conventional Processing*

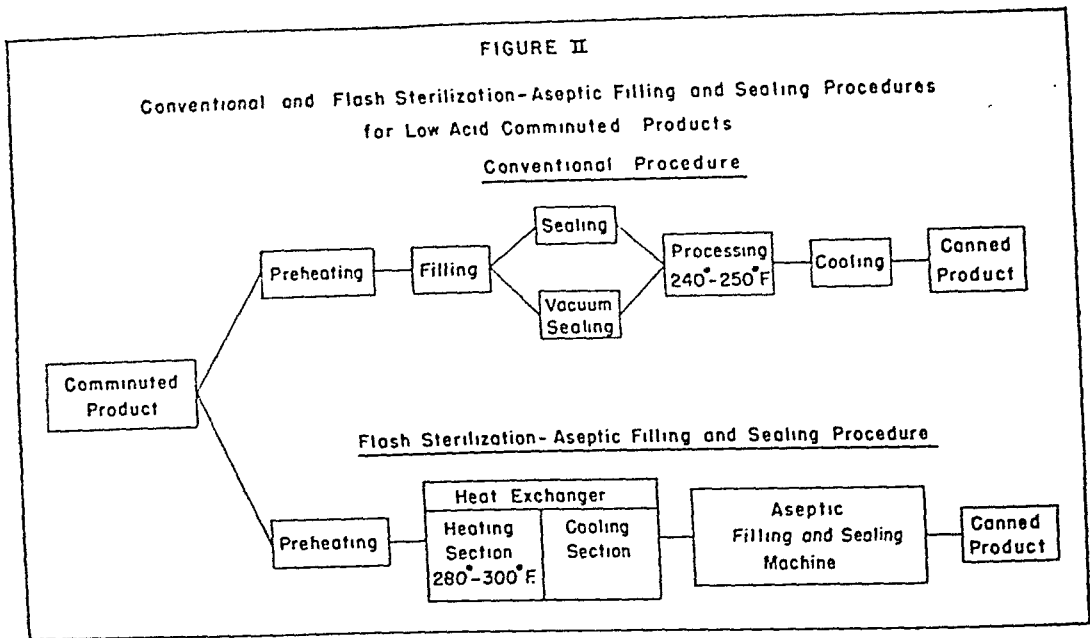
Type Process	Number of Surveys	Range of Thiamin Retention During Processing † Per cent
Conventional *	5	82 to 110
Flash	3	87 to 102

\* 307 x 409 cans

† Based on the thiamin content of the juice before processing

FLASH PROCESSING—ASEPTIC FILLING  
OF LOW ACID PRODUCTS

Another new type of flash processing adaptable particularly to low-acid products capable of being moved by pump through a tubular heat interchanger came into commercial usage shortly before the outbreak of war. This procedure is especially well adapted to the packing of low-acid vegetable purees, strained foods, certain dairy products,



and other foods of a semi-solid consistency. In many instances this technique has yielded products distinctly higher in quality than those produced by conventional means. It has further made possible the canning of commodities whose quality would be entirely unacceptable to consumers if processed by conventional procedures. Figure II broadly compares this new process with the conventional procedures for vegetable purees commonly employed. As will be noted, in this new method of processing the sterilized food and the sterilized can meet in the aseptic filling and closing machine where the filling and double-seaming or sealing are carried out. Thus, the quality of the final product in this procedure is independent of can size. In the conventional method of processing, food is heated in the sealed can. To effect sterilization, heat must penetrate from the body and ends of the container to the food in the center of the can. This rate of heat penetration is quite slow for food products which heat largely or solely by conduction; likewise the rate of heat penetration into large cans is slower than into small cans of the same conduction-heating product. This means that at conven-

tional process temperatures (240° or 250° F.) the process times required for the larger can sizes are much longer than those necessary for the smaller container sizes. The product quality in the large containers is therefore invariably lower than the same product packed in the smaller can sizes.

The influence of the high-short type of process on vitamin retention in low-acid foods has been under investigation in this laboratory since 1932. Some of the results obtained have been reported elsewhere<sup>8</sup>; likewise the effects on vitamins of high-short processes with sterilizing values ( $F_0$  values) several times higher than those used conventionally have been described.<sup>13, 14</sup> Briefly stated, in the high-short processing of low-acid, conduction-heating products, the ratio of the rate of thermal destruction of bacteria, capable of causing spoilage, to the rate of thermal destruction of certain of the vitamins is considerably greater than the similar ratio in conventional processing of the same product.

The relative effects on thiamin of the flash-aseptic filling and closing process and the conventional procedure on pea puree and cream style corn are shown

TABLE 3  
*Thiamin Retention During Flash and Conventional Processing*

<i>Product</i>	<i>Type Process</i>	<i>Process Order ° F.</i>	<i>Thiamin Content Mg./100 gm.</i>
Cream Style Corn	Conventional	6	0.040
	Flash	26	0.101
Cream Style Corn	Conventional	9	0.025
	Flash	26	0.053
Pea Puree	Conventional *	5	0.180
	Flash †	24	0.2214

\* Composite of 6 cans (211 x 413)

† Average of 10 individual cans (211 x 413)

in Table 3. Except for the manner of thermal processing, these purees were identical and the superior retention of thiamin by the flash process is clearly suggested by the data. This new processing technique is to be extended to many canned products for which it is suited.

#### AGITATED VACUUM PACK FOR LOW-ACID VEGETABLES

The vacuum packing of certain low-acid vegetables has been a commercial procedure for a number of years. This style of pack, widely used for whole grain corn, is differentiated from the more familiar "brine style" pack first, by the higher ratio of solids to liquids in the can, and second, by the use of vacuum sealing for the container. In the brine style pack, after the corn has been filled into the can, the fill of the container is completed by brine. In the vacuum pack only 1 to 2 oz. of brine are added to the can. During heat processing, the moisture in the evacuated can is converted to steam which serves as the transfer medium. The heat process required commercially for the vacuum packed 307 x 306 can of whole grain corn (35' @ 250° F.) is more severe than that necessary for the brine packed No. 2 can of the same product (25' @ 250° F.) although the drained weights of both containers are closely similar.

Equipment has been available for many years for agitation of cans during

processing in order to increase the rate of heat penetration into the can and thus shorten the process time required. Over the past two years experimental work was carried out in our laboratories to determine the possible benefit of agitating vacuum packed products during processing. Agitation in products of this type increases the rate of heat transfer within the vacuum sealed container and thus permits adequate sterilization in a much shorter time than when the product is processed without agitation. Conceivably, this shorter process time might influence color and flavor of the final product. Actually, distinct quality advantages to both white and yellow vacuum packed whole grain corn were found to result and this type of process became commercial for corn during the 1946 season.

To test effects of this new processing technique on vitamin retention, controlled experiments were carried on on whole grain corn during the 1946 season. The results of two series of experiments are shown in Table 4 covering the two can sizes used commercially. For direct comparison, brine style, still-processed vacuum, and agitated vacuum packs were made in the same size of container and the thiamin and niacin contents of both the solid and liquid phases in the cans were determined in order to arrive at the total amounts of these vitamins in the containers after processing. In this way, correction was made for loss of vitamins from the solid



TABLE 4  
Vitamin Retention in Canned Yellow Whole Grain Corn  
Effect of Style of Pack

Series	Style Pack	Can Size	Process Schedule		Vitamin Retention *	
			Time Min.	Temp. ° F.	Thiamin Per cent	Niacin Per cent
1	Brine	307 x 306	25	250	68	106
	Vacuum	"	35	250	51	95
	Agitated Vacuum	"	12	250	75	94
2	Brine	603 x 408	40	250	61	94
	Vacuum	"	60	250	33	98
	Agitated Vacuum	"	17	250	51	99

\* Based on the vitamin contents of the corn before processing

to the liquid phases by solution or extraction during processing.

The data in Table 4 indicate that agitation of vacuum packed yellow whole grain corn during processing increases thiamin retention over that attained in the orthodox or still-processed vacuum style of pack. Thiamin retention in the brine style and agitated vacuum packs appeared approximately equal; other series not reported here, however, have indicated a somewhat greater thiamin retention for the new processing technique. Niacin retention in the product appeared not to be influenced by the style of pack. Besides the quality advantages to vacuum packed whole grain corn bestowed by the agitating process, a higher retention of thiamin than that achieved in the conventional vacuum pack method is clearly indicated.

#### CONCLUSION

An attempt has been made to present typical studies currently included in nutrition research on canned foods. Certain of these appear to have distinct public health implications since they should ultimately lead toward even greater degrees of vitamin retention in certain canned foods than are now attained commercially.

*Acknowledgment*—Appreciation is expressed to Drs. J. F. Feaster and Margaret Ives and Mrs. Marshall Tompkins for the data included

in this manuscript and to Miss Edwyna Preiss for her valued assistance in its preparation.

#### REFERENCES

1. National Canners Association—Can Manufacturers Institute Nutrition Program. 1. Background. Pilcher, R. W. Supplement to N.C.A. Information Letter No. 1073: 89-91 (Feb. 12), 1946; 2. Progress. Clifcorn, L. E. *Ibid.*: 91-95; 3. Objectives. Esty, J. R. *Ibid.*: 95-96.
2. Moore, E. L., Wiederhold, E., Atkins, C. D., and MacDowell, L. G. Ascorbic Acid Retention in Florida Grapefruit Juices. *Canner*, 98:24-26, 1944.
3. Wagner, J. R., Ives, M., Strong, F. M., and Elvehjem, C. A. Nutritive Value of Canned Foods. VII. Effect of Commercial Canning and Short Time Storage on Ascorbic Acid Content of Grapefruit Juice. *Food Research*, 10:469-475, 1945.
4. Lamb, F. C. Nutritive Value of Canned Foods. Factors Affecting the Ascorbic Acid Content of Canned Orange and Grapefruit Juices. *Indust. & Engin. Chem.*, 38:860-864, 1946.
5. Clifcorn, L. E., and Heberlein. Thiamin Content of Vegetables. Effect of Commercial Canning. *Indust. & Engin. Chem.*, 36:168-71, 1944.
6. Feaster, J. F., and Alexander, O. R. Planning Nutrition Studies Involving Canned Foods. *Indust. & Engin. Chem.*, 36:172-176, 1944.
7. Guerrant, N. V., Vavich, M. G., Fardig, O. B., Dutcher, R. A., and Stern, R. M. The Nutritive Value of Canned Foods. Changes in the Vitamin Content of Foods During Canning. *J. Nutrition*, 32: 435-458, 1946.
8. Jackson, J. M., Feaster, J. F., and Pilcher, R. W. The Effect of Canning Procedures on Vitamins in Foods. *Proc. Inst. Food Tech.*, 81-90, 1945.
9. Lamb, F. C. Personal communication, 1946.
10. Pearce, W. E. Sources of Contamination in the Manufacture of Tomato Juice. *Fruit Products J.*, Mar., 1940, p. 205.
11. Williams, O. B. Sources of Contamination in the Manufacture of Tomato Juice. *Fruit Products J.*, Mar., 1940, p. 209.
12. Wesel, D. J., and Benjamin, H. A. Process Control of Heat Resistant Spoilage Organisms in Tomato Juice. *Fruit Products J.*, 178-180, 189 (Feb.), 1941.
13. Greenwood, D. A., Kraybill, H. R., Feaster, J. F., and Jackson, J. M. Vitamin Retention in Processed Meat—Effect of Thermal Processing. *Indust. & Engin. Chem.*, 36:922-926, 1944.
14. Feaster, J. F., Jackson, J. M., Greenwood, D. A., and Kraybill, H. R. Vitamin Retention in Processed Meat—Effect of Storage. *Indust. & Engin. Chem.*, 33:87-90, 1946.

## Proposed Report on Field Training of Public Health Personnel\*

THE proper training of public health personnel requires not only formal academic training but also the opportunity to study the field application of the principles learned in the classroom. Field observation and study are to public health education what the student laboratory and internship are to medical education.

It would, therefore, be desirable to incorporate a period of field training as a part of formal education provided by various accredited schools and universities. Such a period is required in the training of public health nurses and is required by some universities for other types of personnel. To require such experience for all personnel is not feasible today because of the lack of a suitable number of areas within which such training may be obtained. It is essential, therefore, that suitable field training areas be developed and that these areas attain certain standards as evidence of their capacity to serve as student training centers.

It is apparent, however, that great variation exists in form and objective of field training. The student who merely visits a health department for a few

hours a day is undergoing a very different educational experience from that of the student who spends several months as a junior employee; yet each is experiencing field training. Each type has its place, yet the purpose served by each is very different. The types of field training and the objectives of each type are set forth below.

Equally apparent is the fact that every public health agency is not suitable for the purpose of field training. Such training requires not only the conduct of a health program worthy of study and demonstration, but also personnel who have both time, willingness, and ability to accept students for training. Just as certain hospitals are not suitable for the teaching of nursing or the training of interns or residents, so certain health departments may not be acceptable agencies to conduct public health training. Similarly a department capable of furnishing a certain type of field experience may not be capable of offering other types of training.

The committee has attempted, therefore, to establish certain standards which may serve as a guide in the development of field training areas. The committee recognizes that these standards are, of necessity, provisional and in many instances reflect a lower quality of service than might be desired. On the other hand, it has been forced reluctantly to accept the fact that many field training areas in all parts of the United States do not attain even these minimum standards. Like all other standards, they should be raised at a later date when

---

\* The Committee on Professional Education of the American Public Health Association publishes this report before transmittal to the Governing Council in order to permit the members and Fellows of the Association to review it and to offer criticisms and suggestions in the further consideration of the report. Suggestions should be mailed promptly to the Committee on Professional Education, A.P.H.A., 1790 Broadway, New York 19, N. Y.

This report, like all other statements of the committee on professional and technical qualifications in public health, is subject to periodic revision in order that it may be kept abreast of the best thought.

the quality of service that they attempt to measure has been suitably improved.

The committee likewise recognizes that there is at present a great dearth of suitable field training areas. This dearth has necessitated the utilization of facilities that are lacking many of the features that should be required of all field training areas, and at the same time has prevented the schools of public health and the universities from requiring the amount of field experience that they would otherwise desire. This lack of facilities is found in all parts of the United States.

The shortage has been brought about in part by the fact that field training is expensive under all circumstances and especially if it is to maintain suitable standards of quality. The quality of health service performed by the agency must be high, a fact which in itself implies appreciable expenditures. In addition, the presence of students is time consuming to the staff. Yet unless the staff members devote certain time to their training responsibilities, the student can learn but little from the experience. Proper field training, therefore, usually necessitates the employment of additional staff to assume direction for the training or to compensate for the time devoted to this activity by the regular staff. While the training area benefits from the stimulus of student visits, criticism, and participation, it is believed that the added expense should not be carried by the local community that is already supporting a health program of high quality. It would seem reasonable that the added expense should be assessed against the general cost of public health education. The universities, however, cannot be asked to carry the financial burden of providing field training. Their funds are extremely limited, drawn largely from limited endowment or from the taxpayers of the few states in which the universities are located. These funds must be used to

carry the mounting costs of formal academic classwork. The small sums that they can afford to pay for field training charges cannot be appreciably increased without new sources of revenue; at present these fees are grossly inadequate to recompense the community for its added expenses incidental to the development of proper field training facilities. Were the added costs to be paid by either the university or the state, the facilities would inevitably become limited to reception of students from certain colleges or states. This would not only result in an uneven distribution of costs but also result in undesirable provincialism.

The committee is, therefore, of the opinion that the cost incidental to the development of better field training facilities should be borne by the federal government except for those areas offering opportunities only for observation and orientation, which are considered to be state responsibilities. Federal interest in public health training and education has already been expressed in the provisions for training stipends. It is, therefore, recommended that additional grants be made through state health departments for the specific purpose of developing in some states one or more field training areas which will offer to persons, irrespective of school or residence, the types of training set forth in this report and will meet the standards likewise set forth herein.

#### DEFINITIONS AND OBJECTIVES OF FIELD TRAINING

Field training is defined as an opportunity to study the field application of the principles and practices of public health. There are several types of field training, each of which is designed to serve a distinct purpose. These types are:

##### A. *Observation*

*Definition*—A planned visit to a health agency to observe the pub-

lic health program without active participation therein.

*Objective*—To see the functioning of an efficient community health program. The duration of the visit is usually brief (one to a few days). The planning is individualized on the basis of past experience and special interests. Observation may be of value to the uninitiated as well as to the highly skilled.

#### B. Orientation

*Definition*—Preparation of a person for a specific job under the auspices of the employing agency.

*Objective*—To acquaint the prospective employee with administrative details and policies of the employing and related agencies and the conditions under which he is to work; for example, background, laws, regulations, records, personnel, and health problems of the area. The duration of a planned period for orientation is usually a matter of a few weeks.

#### C. Supervised Field Experience

*Definition*—Planned instruction observation and active participation in a comprehensive organized public health program as an integral part of or a sequel to formal academic training in public health.

*Objective*—To learn to apply the basic principles and skills studied in a university course to actual field situation. It may or may not be a requirement for an academic degree. The duration of a planned period of Field Experience is usually from 2 to 4 months.

#### D. Apprenticeship

*Definition*—An extended period of active service under supervision in a public health program but without prior academic training in public health.

*Objective*—To select personnel best suited for formal academic training, to prepare them to receive the maximum benefit from such training and to develop certain elementary skills by participation in the public health program as assist-

ants to qualified workers in their professional field. The period of apprenticeship is usually for a period not to exceed one year.

#### E. Residency

*Definition*—An extended period of active service under supervision in a public health program following a period of formal academic training in public health.

*Objective*—To develop through supervised practice a high degree of technical skill and confidence in a person who has had broad basic academic training in public health. This is usually accomplished through occupancy of a first level staff position in an organized health agency already employing competent supervisory personnel. It corresponds to the year of supervised experience required in public health nursing and is comparable to the residence required for certification in medical specialties. It may or may not be a requirement for an academic degree.

### MINIMUM STANDARDS FOR FIELD TRAINING AREAS

#### I. TYPE OF AGENCY

- A. Well organized and well established official local health department, either county, city, or district, or
- B. Well organized and well established official and nonofficial agencies in which there is joint planning of the training program.

#### II. UNIT OF POPULATION SERVED

Although no unit of population is specified, experience shows that areas of less than 25,000 population are rarely qualified to give suitable field training. In large units serving several hundred thousand persons or more, it is customary to select certain areas within the unit to be developed for student programs.

#### III. LOCATION AND TYPE OF AREA

- A. The local area should present a cross-section of typical health and

administrative problems for that section of the country in which the area is located.

- B. The field training area should be located in a state having the necessary facilities to give strong leadership and close supervision to the project.
- C. For orientation the area preferably should be located in the state in which the person is to work.
- D. The area selected for supervised field experience should present problems comparable though not necessarily similar to those of the area in which the student will return upon completion of training. Training need not be given in the same or a contiguous state. There should be joint planning, evaluation, and coordination of student academic and field work between educational institution and field training center.
- E. For apprenticeship and residency any local unit which qualified as a field training area so far as concerns the basic service program and quality of staff may be used.

#### IV. BASIC SERVICE PROGRAM

- A. A comprehensive program should be planned on a community-wide basis in cooperation with other community agencies and based upon a careful study of local health problems. It is desirable that the community plan should be based on facilities and needs for preventive, hospital, and medical care services.
- B. The activities of official and non-official agencies should be coordinated into a community-wide program. The students should have experience in working with all types of agencies in the community contributing to the health, welfare, and education of the people.
- C. The state health department, in cooperation with the local unit, should plan for periodic program evaluation based upon evaluation

standards of the American Public Health Association.

- D. The scope and quality of the public health program should be above the median in at least half of the applicable items as set forth in the *Health Practice Indices 1943-1944* prepared by the Committee on Administrative Practice of the A.P.H.A. August, 1945, and within the first quartile for at least half of the items applicable to the work of the students for whom training is contemplated.

#### V. PERSONNEL

- A. The number of personnel should be adequate to provide local services and educational experience for the students. The desirable number of personnel should be not less than—
  - 1. A full-time medical health officer and medical service, either full- or part-time equivalent to one medical officer per each 50,000 persons in excess of initial 50,000 population.
  - 2. One nurse at the supervisory level for every unit of ten or less staff nurses.
  - 3. One staff nurse per 5,000 persons (exclusive of complete bedside nursing care).
  - 4. One sanitation worker with graduate training in public health who, if not a public health engineer, should be supervised at the state, district, or local level by a qualified public health engineer who participates in the students training program, and one sanitarian or sanitary inspector per 15,000 population in excess of initial 15,000 population.
  - 5. The services of a health educator either as a member of the staff or available on a state or district basis.
  - 6. One stenographic, clerical and

record person per 15,000 population.

7. An educational director for each type of personnel received for training, such director to be available either as a member of the local staff or as a member of the district or state staff with special responsibilities for training duties.

- B. The staff of the health department should meet professional standards established by the Committee on Professional Education of the American Public Health Association, National Organization for Public Health Nursing, and other national voluntary professional groups, the U. S. Public Health Service, and the state merit system in which the area is located. Members of the staff who deal with students should be qualified by education and experience, and should be mature, emotionally stable persons who are interested in teaching.

#### VI. STUDENT LOAD

- A. Observation—no formal limitations in number but too frequent visits may impair efficiency of unit.
- B. Orientation, apprenticeship, and residency—no formal limitations in number but in general more students can be accepted at any one time than for supervised field experience.
- C. Supervised field experience—in general, not more than one student at any one time per corresponding qualified staff member.
- D. It is desirable that the total number of students at any one time, other than for observation, should not exceed the rate of one per corresponding staff member.
- E. No staff member should have continuous direct student supervision responsibilities (throughout the entire year) for more than 9 months out of the year.

#### VII. RESPONSIBILITIES OF VARIOUS AGENCIES

##### A. State Health Department—

1. To help plan and evaluate the basic and field training programs.
2. To provide general supervision and consultation. In large urban units the general supervision and consultation service may be given largely by the central staff of the local health department.
3. To assist with the coordination of academic and field training programs.
4. To assist in providing in-service training for staff members participating in the student program.
5. To serve as a field training student placement clearinghouse for all agencies within and without the state.
6. To be responsible for securing adequate financial support for the training program based on cost analysis of the program.

##### B. Local Health Department—

1. To maintain a basic service program so that the area will qualify as a field training area according to standards listed above.
2. In cooperation with the state department of health, universities, colleges, and other agencies using the area, to plan, develop, administer, and evaluate the educational experiences provided for the students.

##### C. University, Colleges and Other Agencies Using the Area—

1. To determine individual student needs and to assist in planning of educational experiences for students.
2. To assist with coordination of academic and field experiences.
3. To assume such financial responsibility for student training as may

be agreed upon with federal, state, and local health agencies.

D. Federal Agencies—

1. To help finance field training areas through financial grants-in-aid by way of the selected

state department of health or educational institutions.

2. To act in a general advisory capacity to the state or local agencies through the the regional offices of the federal agencies.

COMMITTEE ON PROFESSIONAL EDUCATION

WILLIAM P. SHEPARD, M.D., *Chairman*  
 REGINALD M. ATWATER, M.D., *Secretary*  
 GAYLORD W. ANDERSON, M.D.  
 W. W. BAUER, M.D.  
 ROBERT D. DETRIES, M.D.  
 ELLA E. McNEIL, R.N.  
 HUGO MUENCH, M.D.  
 WILSON G. SMILLIE, M.D.  
 ERNEST L. STEBBINS, M.D.  
 RALPH E. TARBETT, C.E.

CLAIR E. TURNER, DR.P.H.  
 V. A. VAN VOLKENBURGH, M.D.  
 HUNTINGTON WILLIAMS, M.D.

*Consultants*

EDWARD S. GODFREY, JR., M.D.  
 GEORGE H. RAMSEY  
 LOWELL J. REED, PH.D.  
 C.-E. A. WINSLOW, DR.P.H.

The Subcommittee assisting with the preparation of this report. to whom the Committee on Professional Education expresses grateful appreciation, consisted of:

GAYLORD W. ANDERSON, M.D., *Chairman*  
 BENJAMIN G. HORNING, M.D.  
 EDWARD G. MCGAVRAN, M.D.  
 PEARL McIVER  
 ROY J. MORTON  
 WILSON G. SMILLIE, M.D.

*Consultants*

EDWARD S. GODFREY, JR., M.D.  
 JOHN E. GORDON, M.D.

# A New Method of Selecting Health Officers-in-Training

MARGARET W. BARNARD, M.D., DR.P.H., F.A.P.H.A., AND  
WILLIAM BRODY

*Director of District Health Administration; and Director of Personnel;  
Department of Health, City of New York*

THE candidates seated themselves around a table and conducted their own examination. The examiners just watched and listened. This was the new method which the New York City Department of Health used in selecting its new Health officers-in-training.

Proper selection of individuals for the Health officer-in-training group is a matter of concern both to the individual and to the department. The training course itself is of two years' duration, at a stipend level, and the individual pledges himself to remain two years in the field for which he is trained. A decision to enter this training course is a serious one, often involving considerable readjustment of personal and family plans. The trainee who is selected has the right to feel that those responsible for his selection believe he will make good in his new career venture.

The department is concerned with training career men and women for positions in public health administration or as executives in specialized fields. Each candidate has given evidence of adequate basic training in medicine; whether he possesses the aptitudes and potential skills necessary for a successful executive officer in public health is the problem of the examining committee. Public Health knowledge is not required, for the successful candidate will undergo two years of specialized train-

ing in this field. More important factors are intellectual curiosity; the ability to reason logically, to present facts clearly to others, and to make one's point without arousing antagonism; leadership ability; easy acceptance by a group as a desirable participating member; an awareness of broad social and community problems and trends; an "engineering sense" in attacking problems; and adequate reasons for wishing to specialize in a particular field. These and a host of others are the intangible but tremendously important qualities inherent in the successful career individual in public office. Usually, written examinations are employed to test knowledge of subject matter and subsequent oral examinations are employed to evaluate such traits as those mentioned above. It is believed that the group oral performance test described in this paper offers a novel means of evaluation which is more effective than the traditional examination techniques.

## THE POSITION

Health-officers-in-training are nominated by the Department of Health, subject to approval by the Municipal Civil Service Commission, for a two year training course. Eight months of this will be in a school of public health, leading to the degree of Master of Public Health. Each trainee is also



given a 16 month orientation course within the Department of Health. Tuition fees and a stipend for the two year program are paid for out of funds made available by the U. S. Public Health Service.

Those who complete the program are eligible to participate in a competitive civil service examination for the position of assistant district health officer (\$4,500 per annum and over).

The minimum requirements for the position of health-officer-in-training are:

1. United States citizenship.
2. Graduation from an approved medical school.
3. One year internship or residency in a general hospital approved by the American Medical Association (except that those applicants whose internship or residency had to be reduced because of the war emergency shall be required to have nine months' internship or residency in a general hospital approved for internship by the American Medical Association).
4. Eligibility for license to practise in New York State.

#### THE CANDIDATES

Candidates for these positions are secured by means of a continuous recruiting program. Directors of the various bureaus of the Department of Health are always alert to the development of potential health officers among their staff physicians and among the applicants for medical positions. Administrative officials in schools of public health are aware of this program and refer some of their most promising students and applicants for consideration.

Each candidate is interviewed personally by the Director of District Health Administration when he first presents himself. This interview lasts for approximately an hour and serves the dual function of discouraging those who are obviously not qualified and encouraging those who seem qualified.

#### THE PRELIMINARY EXAMINATION

All candidates who had received this personal interview during the four month period since the previous examination for this position and who had become sufficiently interested to file applications were invited to an "experience interview test." Each of the twelve candidates who responded was interviewed for a period of approximately 15 minutes by a board of examiners consisting of three staff members of the Department of Health (the Director of District Health Administration, the Director of Personnel, and a Senior District Health Officer), and Dr. Thomas Dublin, Professor of Preventive Medicine at the Long Island College of Medicine. This interview served the purpose of eliminating those candidates who were unable to meet the minimum requirements as well as those who, in the judgment of the examiners, were obviously not qualified for the training program. Four candidates were eliminated at this stage.

#### THE PREPARATORY MATERIAL

Each participant in the preliminary examination was given a set of instructions which (1) explained the purpose of the experience interview, (2) pointed out that those who seemed best qualified would be summoned for a "group oral performance test" five days later, (3) indicated that results of the preliminary test would be available within two days, and (4) stated that as part of the group test, "each of those summoned will be called upon for the following:

##### I.

You and the other members of the group, as leading physicians known to be interested in matters affecting the health of your community, have been invited by the Commissioner of Health of the City of New York to consider the following problem, and to give him group recommendations. These recommendations are to be forwarded to the Commissioner at the close of your meeting:

Rabies among animals is increasing rapidly. There are about 200,000 licensed dogs and

an estimated additional 200,000 dogs in the New York City area. What control measures should be taken?

## II.

Assume that you have been called upon to deliver a talk of three to five minutes on whichever one of the following subjects you select. Deliver the talk as if the group specified were before you now.

1. You are attending a meeting of the Committee on Public Health of your County Medical Society. The committee has passed a resolution urging the City Department of Health to establish a post-war program for the control of tropical diseases. As a member of the committee you are called upon to express your views as to what the official health agency in the city might do toward this end.

2. You are attending a meeting of the Parent-Teachers Association of a private school to which you send your child. The subject of rheumatic fever is being discussed and you are called upon by the chairman to discuss the public health implications of rheumatic fever as it might involve this school.

3. The District Health Officer has requested you, as a leading physician in the community, to address a group of parents concerning the following problem:

A large number of veterans' families have moved into a local housing project. There are more than the usual number of babies and preschool children in this group. Although the District Health Officer believes that immunization is necessary, the parents have been slow to have this done.

4. You, as a leading pediatrician, have been requested to address a group of general practitioners in your County Medical Society on the rôle of the general practitioner in carrying out systematic health supervision and health promotion of well children.

5. The County Medical Society has requested you to speak as a representative of the Department of Health on the use of gamma globulin for measles.

6. At a Kiwanis luncheon you as one of the medical members are asked to tell the group about the present smallpox situation in New York City and advise them what to do for themselves and their families.

7. A community which has many mosquitoes hears that there are several veterans in a nearby hospital with malaria. The voluntary health agencies have become alarmed and have asked you to speak at a joint meeting of the members of these agencies to discuss the problem.

8. In a community close to which there is a large shipyard, venereal disease has increased suddenly and there seems to be in the community a correlated social disorganization. Discuss this problem in one of the following roles:

- (a) Medical officer of the shipyard to the employees
- (b) Venereal disease control officer of the area to leaders of civic agencies
- (c) Director of social hygiene to a management group
- (d) Venereal disease control officer to a women's club group

## THE GROUP ORAL PERFORMANCE

### TEST

The rating board for this test consisted of the same four examiners who participated in the experience interview. Two of them sat along each of the long walls of the examination room.

As the candidates arrived they were allowed to select their own seats around a conference table. As soon as all eight\* were seated, each was given a single sheet on which was the same information as in Part I of the preparatory material, with the addition of the following two paragraphs:

You will be rated on the value of your contribution to the recommendations made, your approach to the problem, your group participation, and your manner and speech in presenting your opinions.

Speak clearly so that everyone can hear you. The group itself will decide how the discussion is to be carried on. Start the discussion as soon as everyone has finished reading this statement. Continue until a signal is given to stop.

No additional directions were given and no questions were asked by the examiners.

Within 2 minutes one of the candidates took the lead and before long all were participating in the discussion. After about 30 minutes they agreed to select one of their members as secretary.

About 30 minutes later the examiner in charge announced the conclusion of

\* If more than ten or twelve candidates had been involved, it would have been necessary to divide them into subgroups.

that part of the test, and a 5 minute recess was taken.

The examiners then reversed their seats along the wall, while the candidates elected to resume the same seats at the table.

The material which was distributed to the candidates at this point consisted of Part II of the preparatory material, with the following additional comments:

After you have finished, the members of the group will assume that they constitute the group you have chosen and will ask you appropriate questions.

The order in which each individual is to speak will be determined by the group. The group will also decide how much time should be allowed for general discussion after each talk.

Start the discussions as soon as everyone has finished reading this statement.

Speak clearly. You will be rated both on your own presentation and on the questions you ask.

After a very brief discussion the group selected the first speaker and agreed to proceed in the same order as they were seated.

When the first speaker had concluded his talk, the group was at a loss as to how to proceed. It was obvious to the examiners that no candidate had read the last four paragraphs of the instructions, and it became necessary to direct the group to do so. If this development had been foreseen, it would have been a simple matter to place this explanatory material at the beginning of the instruction sheet.

Thereafter the program continued without complications. It may be of interest to note that every speaker exceeded the prescribed length of time for the talk (in one case the elapsed time was 15 minutes), but the group rigidly held to its self-imposed time limit of 5 minutes for general discussion after each talk.

The examiners had prepared a third problem similar in form, but not in content, to the first. This was to be given

to the group at the examination so that no previous preparation for answering could be made. However, the examiners unanimously agreed that they had learned enough about the candidates on the basis of the two prepared topics. The examination was concluded slightly less than 3 hours after it had begun.

#### SOME PERTINENT OBSERVATIONS

1. *Previous Experiments*—The technique of the group oral performance test is based upon methods developed by the British Army in selecting officers during World War II and experiments conducted by the Test Development Section of the U. S. Civil Service Commission under the direction of Mr. Milton M. Mandell.

2. *Advance Preparation*—One important variant introduced in the health officer-in-training test is the device of presenting the problems to the candidates in advance. This was designed to eliminate the advantage which might accrue to some candidate or candidates because of fortuitous special knowledge of the subject.

In this connection, two important factors should be noted. In the first place, this examination is not designed to test for knowledge. In the specific situation, a common basic knowledge of medical theory could be presumed because of the minimum requirements; no further knowledge was considered as important for selection purposes because successful candidates would undergo the two year training course.

In the second place, the ability of the candidates to gather appropriate data in the five day period after receiving the preparatory material was considered to be a significant element in rating.

The candidates were not given specific information about the nature of the test in advance. For example, they were not informed that there would be a general discussion after each individual talk.

3. *Name Cards*—Another innovation which is interesting if not quite so important is the use of name cards. Each candidate was furnished with a folded sheet of heavy cardboard (5" x 10") with his own name in large letters on two sides. This had the double advantage of enabling the candidates to address each other by name, thus minimizing the artificiality of the situation, and of insuring the examiners against assigning ratings to the wrong people.

4. *Rating Factors*—The examiners rated each of the candidates on each of six factors. Each examiner determined his final rating of each candidate by adding the six factor ratings and the experience rating (arrived at in the preliminary examination) and dividing by 7. The six factors and the elements considered under each factor were:

1. *Appearance and Manner*. Poise, physical alertness, nervousness, restlessness, attentiveness, mannerisms.

2. *Speech*. Power of expression, vocabulary, diction, modulation.

3. *Attitude Toward Group*. Tact, coöperation, ability to mix, flexibility.

4. *Leadership*. Ability to assume lead without giving offense; acceptance by group.

5. *Contribution to Group Performance*. Team-worker or prima donna; awareness of objectives of group discussion, ability to reconcile differences.

6. *Scientific Approach*. Ability to marshal data, awareness of implications, ability to reason, ingenuity, mental alertness, judgment.

5. *Seating Arrangements*—No chair was provided at the head (or at the foot) of the table. Therefore no one candidate could receive any advantage of apparent leadership due to seating. If the group had selected its own chairman, he could of course have moved his seat around to the head of the table. It was interesting that the group did not select any chairman.

The examiners were seated far enough away from the table to allow the group to forget (at least occasionally) that they were present, but not so far

away as to miss anything. At the intermission in the middle of the test, the examiners changed their seats to insure adequate opportunity to observe each candidate.

6. *Extent of Participation*—The degree to which each candidate participated was an important element of the examination. The technique of a brief individual talk was incorporated in the test specifically to insure adequate consideration of even those candidates who might not participate in the general group discussion.

7. *Results*—It was the unanimous opinion of the four examiners, as well as the independent judgment of each of three observers with testing experience but no medical background, that three of the candidates should be considered as not qualified for the training course, while the remaining five showed considerable potentiality. There was less agreement concerning the rank order of the five who were considered qualified. With the exception of one examiner, however, all placed two specific candidates in either first place or second place.

*Advantages of the Group Examination*—The group performance test appears to possess the following advantages over the ordinary oral personality interview:

1. It enables the rating examiners to observe each candidate in action for a period of 3 hours. In the same amount of examiner time each candidate could be granted an individual interview of only 20 minutes.

2. It permits each examiner to devote full time to observing, listening, and taking notes.

3. It eliminates any tendency on the part of examiners to use the oral interview to show what they know rather than to evaluate the candidates.

4. It prevents any loss of reliability caused by the use of different questions for different candidates as well as by information given to later candidates by those examined earlier.

5. It minimizes the effect of the inevitable lack of continuous concentration on the part of examiners.

6. It provides a more natural situation than the usual question and answer contest between a candidate and his examiners.

7. It eliminates any suspicion on the part of any candidate that other candidates may be shown favoritism, be given easier questions, or have a lucky break. It may even convince him that some other candidates are better qualified than he is.

8. It eliminates the following dangers in the conventional oral interview situations.\*

- a. "There exists a tendency for panel members to slant their attention to the candidate's response to their own questions."
- b. "It has been found that the rating to any candidate tends to carry over positively to the following candidate. The consequence is a species of halo effect."

---

\* Pointed out by Norman J. Powell, and Harold Levine in a mimeographed "Manual of Procedures in Oral Tests" prepared for the Civil Service Commission of the City of New York.

9. It provides very valuable information concerning the action of each candidate toward the other members of the group, as well as his reaction to their actions. This is particularly important in testing for positions where group discussions and conferences are essential.

10. It presents specific evidence concerning the ability of each candidate to be a leader in a group of professional colleagues.

11. Those who participate seem to find it more interesting than the individual interview. (Incidentally, this applies to examiners as well as candidates.)

12. It requires no skill in asking extemporaneous questions on the part of the examiners. The topics for group discussion or individual presentation are carefully prepared in advance and the examiners as a group are familiar with what may be expected as reasonably adequate discussion content and what particular points to look for in each topic.

---

## Family and Community Living

Vassar College, Poughkeepsie, N. Y., announces its 22nd Summer Institute for Family and Community Living, July 9-August 6.

As its name implies this is a family school for parents, teachers,

and professional workers. It has facilities for 150 adults in its workshops and seminars and for 132 children in its children's school. Mary Fisher Langmuir, Professor of Child Study, is its director.

# Baltimore's Community Rat Control Program\*

JOHN T. EMLLEN, JR., PH.D.†

*Associate Professor, Department of Zoölogy, University of Wisconsin,  
Madison, Wis.*

POPULAR demand for a reduction of the property damage and disease hazards caused by rats in residential communities, and a wartime need for extensive field tests with ANTU raticide have resulted in the development of an unusual type of program of rat control in Baltimore, Md. This program emphasizes suppressive measures as opposed to exclusion measures (rat-proofing), and is based on the fundamental premise that the rat population of a city block is essentially isolated so that it can be treated as an independent unit. Management of block programs including the execution of periodic eradication campaigns is, in most cases, handled by block residents themselves under the supervision of a central city organization. Business districts are treated as demands arise, but emphasis is placed on residential communities for which the system appears to be particularly applicable.

## HISTORY AND SCOPE OF THE PROGRAM

About 200 residential blocks were used as a testing ground for new thiourea rat poisons by Dr. C. P. Richter in the fall of 1942.<sup>1</sup> Results in many instances were good and the recovery rates of the decimated rat population were unexpectedly slow. On the basis of these successes, the City of Baltimore undertook an ambitious city-wide program based on the block unit principle. An organization was set up in June, 1943, with a field crew of from 8 to 15 men, and about 1,877 city blocks were treated before the end of 1944. A system of volunteer inspectors was concurrently organized to report persistent infestations and reappearances in treated blocks, and to request follow-up treatments as needed. Many of the block campaigns completed during the period were highly successful; a few were unsuccessful.

Encouraged by a favorable public response, the work was reorganized as a Division of the Bureau of Street Cleaning on January 1, 1945. The program was continued in much the same manner as in 1944 except that new emphasis was placed on volunteer coöperators who were authorized to do the poisoning work in their home blocks after receiving appropriate instructions. By the end of 1945, 2,120 citizens had registered as volunteer workers in the program, and 4,160 city blocks had been treated one or more times with a total

---

\* A municipal enterprise supported by city appropriation and established in January, 1945, as a Division of Rodent Control in the Bureau of Street Cleaning. Research studies were conducted partly under a contract, recommended by the Committee on Medical Research, between the Office of Scientific Research and Development and The Johns Hopkins University Medical School, and partly under a grant from the Rockefeller Foundation International Health Division to The Johns Hopkins University, School of Hygiene and Public Health.

† Contribution from the Rodent Ecology Research Project, Department of Parasitology, The Johns Hopkins University, School of Hygiene and Public Health, and The Psychobiological Laboratory, The Johns Hopkins Medical School.

of approximately 100,000 pounds of poisoned bait.

Special attention was given to repeat treatments during the first 6 months of 1946, but 964 new blocks were poisoned, raising the total of blocks treated to 5,574 out of about 6,800 in the city.

#### ENVIRONMENT

Baltimore is a thriving seaport city of 860,000 people, augmented during recent years by an additional 70,000 war workers. Residential structures in downtown areas are almost entirely row houses, two or three stories high, constructed of brick. Small, fenced back yards are usual, opening in the rear onto paved alleys which run through the center of each block and are used for collecting trash and garbage.

The rat population, all brown rats (*Rattus norvegicus*) except in a few waterfront buildings, averages about 75 per block in downtown residential areas.<sup>2</sup> This is believed to be roughly comparable with rat population levels in other cities along the North Atlantic Coast and in the Midwest. About three-fourths of the rats in residential areas live outdoors in yards, garages, and sheds, and one-fourth indoors; very few rats are found in the sewers.

#### PLAN OF PROCEDURE

##### *Areal Units*

The adoption of an essentially isolated areal unit was found to be fundamental to successful rat control in Baltimore. Eradication jobs in single "open" buildings and in small, non-isolated sections of a block have given very incomplete and temporary relief and frequently have led to prejudices against baits among surviving rats, a condition which seriously complicates subsequent control efforts.

Experiments with marked rats have demonstrated the essentially isolated character of a city block, the area bounded by four city streets<sup>2</sup>; and ex-

perience gained in poisoning over 5,500 city blocks has indicated the adequacy of this unit for control operations.

In most cases a plan is followed for coordinating eradication campaigns in neighboring blocks so that sizeable tracts are covered in a single operation. This is largely a measure for convenience and efficiency, for there is no indication at present that isolated blocks recover or are reinvaded any more rapidly after treatment than grouped blocks.

##### *Organizing Block Rat Control Programs*

Since January, 1945, the program has emphasized the scheme of getting citizens to do the work themselves with instructions and materials furnished by the city. Blocks are organized for treatment by soliciting interest among residents or by persuading those people who write or telephone the city office for help that the solution to their personal problem with rats lies in a community program in their block.

Once a person has been found who will assume the responsibility of organizing a block team, mimeographed bulletins prepared by the city on "How to Organize and Practice Community Rat Control" and "Rat Control in Urban Residential Baltimore" are forwarded together with a petition form which may be filled out and returned, ordering the baiting materials and instructions necessary for staging a community campaign.

Upon receiving a completed petition form, the city issues an identification card to the responsible leader who is designated as the "block captain." A community meeting may be scheduled and field demonstrations of eradication procedures are given by experienced city men before any work is undertaken.

Not all blocks are handled by volunteers. A city crew performs the work in cases of special urgency and in blocks where a local lack of public response has resulted in the leaving of heavy infestation spots in otherwise clean sections of the city.

### *Eradication Campaigns*

The first activity of a block rat control team is the staging of an intensive eradication campaign through all buildings, yards, and lots in the block. This is done in a single operation. The steps of an eradication campaign are:

1. *Notification of block residents*—Residents are notified of a prospective campaign by means of placards which are posted in conspicuous places through the block and by notice cards which are distributed to all houses. The notices inform the residents of the intentions of the volunteer team and the mutual benefits which can be had through coöperation. They ask resident to clean up all exposed garbage, to leave their gates and outbuildings unlocked at a designated time and to confine their pets. At the same time they warn of the potential danger of the poison to unconfined pets and irresponsible children.

Requests to withhold poison from specified places are, of course, honored. Direct verbal permissions are sought whenever possible, but are not required. A city ordinance directing that properties shall be maintained free of rat infestation may be invoked in stubborn cases as needed.

2. *Distribution of poison bait*—Poison bait, generally ANTU at 3 per cent in finely ground corn,<sup>3</sup> is distributed one or two days after notification or as soon as weather conditions permit. Each registered worker takes a bucket of prepared bait, as supplied to a local headquarters by the city crew, and proceeds through the block from the alley, placing small spoonful-sized piles in exposed and protected sites around all real or potential harborage, food sources, runways, and trails in yards and buildings. From 10 to 50 piles may be placed in an infested property, and from 10 to 40 pounds of bait is commonly used in an average sized block. Thoroughness is emphasized as fundamental to success; and places which cannot be entered are listed for further inspection and attention.

Prebaiting with unpoisoned food for several days or weeks before poisoning, as recommended by various workers, was tried experimentally in sample blocks in Baltimore. Its value, as demonstrated in these tests, did not appear sufficient to warrant the adoption of a prebaiting procedure which would greatly increase and complicate the work of the volunteer coöperators.

3. *Check-up of results*—When ANTU baits are used rats will die during the two days fol-

lowing treatment. Counts of dead rats are made during these two days, and all signs such as rat holes and fresh droppings obliterated on the second or third day, in preparation for further checks on survivors. Residents are asked to sweep up and discard all dead rats and all uneaten bait. A report on the operation is then prepared by the block captain and submitted to the city office.

4. *Follow-up*—Eradication campaigns are followed up immediately with special measures at all sites of persisting infestation. City crews assist in this work with burrow fumigation and traps. (This phase of the work is, at present, inadequately done as a result of poor reporting and technical difficulties.)

5. *Repeat campaigns*—Complete eradication is rarely achieved in a campaign. Thus, repeat treatments are usually indicated once a year and sometimes more often.

Experience with campaigns in the Baltimore program is still limited. The repetition of ANTU-corn campaigns at yearly intervals has been successful, but repeat campaigns at shorter intervals have given some poor results, apparently as a result of bait refusal. The present policy is, therefore, to use ANTU-corn in overall block campaigns once a year, and other measures, such as burrow fumigation, trapping and poisons with alternate poisons and baits, in interim treatments, as needed.

### *Sanitation Program*

Community sanitation, particularly garbage disposal, is regarded as an integral part of rat control in the Baltimore program. Volunteer rat control teams usually take considerable interest in correcting insanitary conditions in their blocks. As an aid in this work one or two sanitary inspectors are assigned to the Rodent Control Division by the Health Department, and sanitary inspector authorizations are given to a limited number of volunteer leaders. More than a thousand notices and several dozen summonses have been handed out in connection with rat control programs during 1945 and the first six months of 1946. As a result of these activities thousands of regulation garbage containers have been installed in treated blocks and hundreds of "unsanitary conditions" eliminated.



### *Ratproofing Program*

Householders are encouraged and instructed in methods of repairing breaks and closing openings in their houses as a means of protecting their homes, breaking up the rat ranges within the block, and delaying reinfestation.

#### ADMINISTRATION OF PROGRAM

A small office force and field force are maintained by the city for the purpose of: (1) handling requests and complaints, (2) organizing volunteer groups, (3) supervising control operations, (4) preparing the delivering baiting materials, (5) giving demonstrations and talks to volunteer groups, (6) coordinating field programs, and (7) conducting eradication work in unorganized blocks. A budget of \$44,000 served to run the program in 1945; the major items of expense were labor and baiting materials.

The coordination of volunteer programs is facilitated by a system of regional and district leaders. Following the pattern of Civilian Defense, the city is divided into ten districts, each placed under the direction of a volunteer "Chief Inspector." The subdivisions and the alignment of officers within a district vary according to the conditions and wishes of the local groups. District captains and their assistants do most of the work of organizing the coordinating block programs. A close cooperative arrangement is maintained between the city officials and the research departments of The Johns Hopkins University, where studies on rat ecology and rat control techniques are conducted.

#### RESULTS OBTAINED

The success of block eradication campaign and of the overall program may be evaluated on the basis of: (1) public reaction, and (2) measured changes in the rat populations.

#### *Public Reaction*

Public reaction often gives an errone-

ous impression of the actual results obtained. It is, however, a measure of the popularity and hence the "health" of the program. Enthusiasm is generally proportional to the number of dead rats recovered rather than the percentage killed and, therefore, is greatest in warm weather when more rats die in places where they are readily found. There is some loss in enthusiasm in repeat campaigns which give poor kills even when the workers recognize that the small recovery may reflect a reduced capital population. Conspicuous failures, as they occasionally occur through faulty technique, are quite damaging to volunteer morale.

Volunteer leaders, taught to expect a 90 per cent reduction, reported their reactions as follows during 1945: Good, 178; Fair, 65; Poor, 48.

Block residents who took no part in the program were questioned in one group of blocks a year after the first poisoning campaign. Their reactions on the success of the campaign were as follows: Good, 73; Fair, 9; Poor, 3.

#### *Measured Results*

Measurements of the success of poisoning campaigns were obtained by making detailed surveys in sample blocks before and shortly after treatment.<sup>4</sup> A comparison of rat signs in these pre- and post-treatment surveys indicates that reductions of between 85 and 95 per cent are commonly obtained in residential blocks when the job is done thoroughly. Kills of from 50 to 80 per cent are encountered where the operators miss a few important yards or buildings, or where recent applications of poison have resulted in bait prejudices among local groups of rats. Heavy rains on the day of poisoning may result in a poor kill, and an inferior quality of corn has been responsible for some poor results during periods of grain shortage.

Periodic censuses following poisoning campaigns show that a decimated popu-

lation in a block will usually increase at a rate of between 2 and 6 per cent of the original population of the block per month.<sup>5</sup> Thus a population reduced to 10 per cent of its original level requires from 15 to 44 months to recover. The average block reaches 58 per cent in one year and will approach complete recovery in 22 months. Populations reduced to 5 per cent or less of the original level often show retarded or delayed recoveries, so that the total period required for recovery is considerably prolonged.

With these reductions and rates of recovery it is clear that repeat campaigns at yearly intervals can hold a rat population well below its saturation level. Where successive campaigns serve to reduce the population to the same point (about 10 per cent of the original level) each year, the average population curve will describe a course like that shown in Figure 1, and the number of rats present will never exceed about 58 per cent of the original population. Should each successive campaign succeed in removing 90 per cent of the rats present, the population can well be forced down to a level from which recovery is very slow and irregular or is delayed for an indefinite period (E in

Figure 1). Special measures at such times may lead to complete extirpation. In one test block which was completely cleared of rats by persistent efforts, no rats reappeared for three years although neighboring blocks were moderately infested.<sup>5</sup>

### Significance of Results

The value of control of the type here described is, of course, limited to the area treated and must be measured in terms of the local destructiveness of rats. Under most circumstances the destructive potentialities of a rat population are probably proportional to its size, and the benefits derived from a reduction campaign proportional to the reduction effected. Thus, in a block population under annual treatment, following the course shown in Figure 1, the total benefits may be appraised by measuring the area above the population line. In this case the benefits vary from 42 to 90 per cent and average 66 per cent throughout the year (C-D in Figure 1.) The greatest benefits may be realized by scheduling campaigns so that the lowest population levels coincide with the season of greatest local destructiveness or disease hazard, generally the summer.

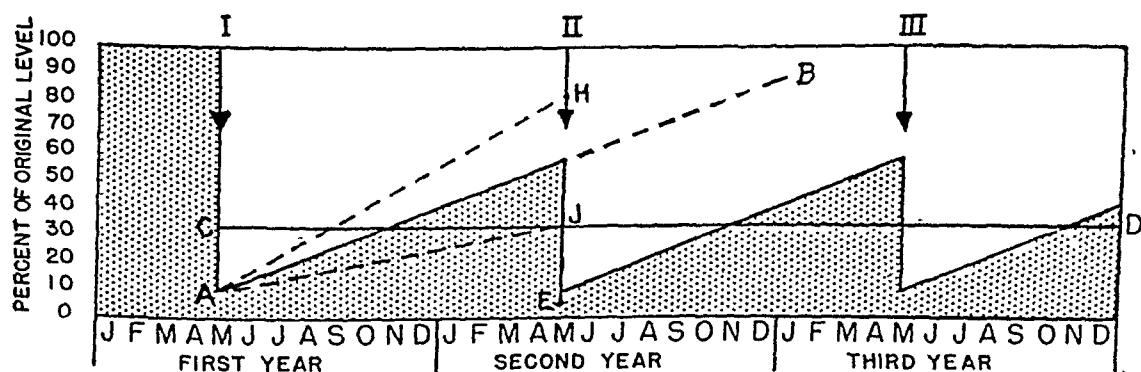


FIGURE 1—Fluctuations of a hypothetical (average) rat population subjected once a year to a thorough eradication campaign. The reductions effected by poisoning (vertical declines) and the slopes of recovery (sloping inclines) are based on actual measurements made on experimental block population in Baltimore. The line A-B represents an average recovery rate; A-H and A-J represent the extremes encountered in measurements in 23 sample blocks.

## LIMITATIONS AND HAZARDS

Baltimore's program of rat control in residential communities as described in this report has a number of limitations which should be considered.

As with any type of suppression program, benefits can be measured only in short-term values. A number of improvements are believed to have been made over other types of suppression campaigns, but any long-term benefits must necessarily rest on continued public support. A serious accident resulting from misuse of poison or a few outstanding failures could greatly injure volunteer morale and thereby disrupt the whole program. Furthermore, it is a common attribute of human beings to drop their enthusiasm as soon as an unfavorable situation has been alleviated and before it has been eliminated.

After a series of comparative field tests, ANTU is still the only raticide considered effective and safe for this type of program.<sup>4</sup> ANTU is of little value against roof rats (*R. rattus*) which occur abundantly in many cities, particularly in the South. When properly used in Baltimore, ANTU gave excellent results against brown rats (*Rattus norvegicus*), but irregular usage has already led to a number of local complications and failures in repeat treatments. A widespread dissemination of ANTU to householders, now that all government restrictions have been lifted, might seriously reduce the effectiveness of ANTU campaigns against brown rats.

Hazards to humans and to pets seem to be relatively small in the type of program used in Baltimore. Every available source of information points to a high tolerance to ANTU by humans, but the potential dangers are still incompletely known. Ten children have been reported to have eaten ANTU baits since 1943; all but one had their stomachs emptied by stomach pump, and none showed any ill effects.

Cats, chickens, and rabbits are rel-

atively resistant to ANTU poisoning, but dogs succumb to doses of as little as 50 mg. per kg.<sup>6</sup> Several dozen dogs, mostly vagrants, have been killed in the Baltimore program. This number is very small, however, when compared with the number of dogs exposed. Close coöperation between dog owners and poison crews minimizes the hazard to dogs, but occasional slips are hard to avoid.

The question of personal and property liability among volunteer workers poses a minor problem which in Baltimore is handled, as it was with air raid wardens, by assigning all responsibility to the volunteer.

## SUMMARY

A procedure for rat control in residential communities has been developed in Baltimore, Md., on the basis of intensive local eradication campaigns repeated at appropriate intervals by volunteer residents under city direction. Four-fifths of the residential blocks of Baltimore have been treated one or more times in the eighteen months since the start of the full-fledged program in January, 1945.

All work is done on an areal unit basis, the square city block being the unit employed. ANTU in ground yellow corn is used as the standard poison bait. Community sanitation and ratproofing are encouraged in conjunction with the baiting campaigns.

Reductions of 85 to 95 per cent are generally obtained in well conducted block campaigns. Populations so decimated usually require from 15 to 44 months to recover to their original levels. Repeat campaigns once a year can thus hold a block population well below its original level and reduce the annual rat damage by about two-thirds.

## REFERENCES

1. Richter, C. P. The Development and Use of Alpha-Naphthyl Thio-urea (ANTU) as a Rat Poison. *J.A.M.A.*, 129:927-931, 1945.
2. Embert, J. T., Jr. The Rat Population of Baltimore, Maryland. (Unpublished manuscript.)

3. Richter, C. P. and Emlen, J. T., Jr. Instructions for Using ANTU as a Poison for the Common Norway Rat. *Pub. Health Rep.*, 61(17):602-607, 1945.

4. Emlen, J. T., Jr. and Stokes, A. W. Effectiveness of Various Rodenticides on Populations of Brown Rats in Baltimore, Maryland. *Pub. Health Rep.* (In press.)

5. Emlen, J. T., Jr., Stokes, A. W., and Winsor, C. M. The Rate of Recovery of Decimated Populations of Brown Rats in Nature. (In press.)

6. Dieke, S. H. and Richter, C. P. Age and Species Variation in the Acute Toxicity of Alpha-Napthyl Thiourea. *Proc. Soc. Exper. Biol. & Med.*, 62:22-25.

---

## A.D.A. Council Rules on Bone Meal and Flourine Products

The Council on Dental Therapeutics of the American Dental Association, Chicago, has recently ruled that bone meal preparations for the prevention of dental decay are not acceptable to the Council.

It is pointed out that during recent months there have appeared on the market a number of preparations containing powdered cattle bone, supplemented with vitamin D, for the treatment and prevention of dental caries. In view of the lack of evidence to show that they are effective for this purpose, preparations of bone meal for the treatment of dental caries are declared not acceptable for inclusion in Accepted Dental Remedies.

The Council has also considered the role of fluorine in dental caries with special reference to synthetic fluoride tablets. It is pointed out that the mechanism through which fluorine produces a lowered caries attack rate is not known. In the opinion of the Council there is no evidence that the protective mechanism, whatever it is, can be effective through fluoride-bearing water supplies in persons after they have reached the age when the teeth are fully formed. It also has not been demonstrated that

the ingestion of fluorine after the teeth are calcified will make the mechanism operative to arrest caries activity in man. They point out that, because of the great popular interest in the potential value of fluorine as an effective agent of caries control, there is ample opportunity for the exploitation of the public and of the professions through the sale of useless and even harmful preparations.

The Council has concluded with reference to many different tablet preparations containing some synthetic salt of fluorine and one or more vitamins, which recently have been offered that, though probably not dangerous in amounts recommended for daily consumption, fluoride added to diets already high in fluorine content or consumed in areas where water supplies contain significant concentrations of fluorine may constitute a health hazard. This possibility and the inconclusive nature of experimental evidence concerning their effectiveness render synthetic fluoride and fluoride-vitamin preparations for use in the treatment of dental caries not acceptable for inclusion in Accepted Dental Remedies at this time.

# Determination of Filth and Extraneous Matter in Dairy Products<sup>\*</sup>

J. O. CLARKE, F.A.P.H.A.

*Food and Drug Administration, Chicago, Ill.*

FILTH and other extraneous matter may enter into dairy products through insanitary and careless practices on the farm, in transit from farm to manufacturing establishment, and in the manufacturing plant itself. Any filth found in a food is not only repugnant in itself, but also is indicative of insanitary and improper conditions of production. Filth such as cow manure, rodent hairs, flies and other insects, fragments of feathers, and dirt may be found in dairy products. When such filth is found, it demonstrates conclusively that the dairy product was produced under insanitary conditions, and the type of contamination gives a clue to the nature of the objectionable condition. For example, a fly leg in cheese shows that the cheese or its components were not protected from flies during their production.

Two distinct operations are involved in all methods for the determination of filth and extraneous matter in dairy products. First the filth or other extraneous matter must be separated from the food itself. It should be noted at this point that while present methods are limited to separation of only the insoluble components of the filth, we are actively engaged in developing methods for separation of the milk soluble components of manure or insects from dairy products. Second, the character or identity and the amount of the extraneous

matter must be determined by visual examination with or without the aid of microscopic techniques. Identification of the elements of filth requires experience and familiarity with the microscopic structure of hairs, insect particles, feathers, manure fragments, etc. The amount of filth may be measured by comparison with specimen sediment pads or the individual filth elements may be counted and the size measured.

It is rarely possible to separate completely the extraneous matter from the food substance itself. However, it is necessary that the separation be sufficiently complete to permit identification of the filth elements. There is no single method suitable for separating filth from all types of dairy products or even all samples of a given type of dairy product. For instance, filth in a sample of sweet cream can be removed by simple emulsification and filtration through a sediment disc. On the other hand, some samples of sour cream resist filtration to an extent requiring treatment of the sample by elaborate chemical methods in order to coax it through the sediment pad. Fresh milk usually can be filtered through a sediment pad with ease, but occasionally its physical condition is such that it becomes very difficult to filter.

Filth and sediment tests are a very useful tool both for the regulatory official and for the industry. However, it is important to note the limitations in interpreting the significance of such tests when negligible amounts of filth or

<sup>\*</sup> Presented before the Laboratory Section of the American Public Health Association at the Seventy-first Annual Meeting in Cleveland, O'ho, November 17, 1946

sediment are found. Such findings may merely indicate that efficient straining, filtering, or centrifugal clarification effectively removed the visible filth. Such devices, however, do not remedy the insanitary conditions responsible for the original contamination and cannot remove the soluble elements of filth.

Tests for filth and extraneous matter are most valuable tools for use in connection with sanitary inspections of dairy products manufacturing plants. During the inspection of a factory the inspector should not only make careful observations of the sanitary conditions of the plant itself, but he should employ field methods for making sediment tests on the milk or cream received by the plant from the producers. All too frequently even those dairy plants which are models of sanitation may accept and use milk or cream containing filth and extraneous matter.

#### MILK

The determination of filth and extraneous matter in milk provides a very valuable index to the quality of the milk not only to the inspector but also to the conscientious manufacturer. Such tests are simple and at the present time revealing. A negative test as previously pointed out may merely mean that the producer did a good job of filtering, but at the present time there is so high an incidence of positive tests in milk delivered for manufacturing purposes that the information furnished by such tests is very valuable. Sediment testing is no substitute for a comprehensive farm inspection program, but it does give a lead to the worst farms. Sediment testing by dairy plants should be performed systematically so that the milk from each producer is tested periodically. When dirty milk is revealed, it should be rejected on the spot and not used for production of dairy products for the market. The producer of rejected milk should be

visited by a representative of the dairy plant in an attempt to correct objectionable practices on the farm. If these efforts fail, the farmer should be denied a market for his milk.

The Food and Drug Administration performs sediment tests at the time of every inspection of dairy plants using milk as a raw material. Bottom-can samples consisting of one pint of milk are collected and passed through a conventional sediment disc. Since large amounts of dirt and filth are uncovered by bottom-can sampling, the test becomes more sensitive than the mixed-can sample test. While the amount of sediment obtained from a bottom-can sample will vary, depending on whether the can of milk has been shaken or stirred, it does, under most conditions of use, reflect the degree of contamination more accurately than the mixed-can sample. Of great importance also is the fact that the bottom-can sample provides an amount of extraneous material sufficient for microscopic identification of the filth present in the milk.

In performing sediment tests, inspectors of the Food and Drug Administration seek to test a cross-section of the milk being received by the dairy plant. The test pads are suitably mounted for transmittal to the laboratory for examination and to provide a permanent record. The quantity of sediment is estimated by comparing the test pads with a photographic strip which pictures sediment pads prepared from milk containing known amounts of sediment measured in milligrams. The amount of sediment is recorded as 0, 0.5 mg., 3.0 mg., 6.0 mg., and 12.0 mg. In practice an instrument is used which removes approximately one pint of milk on the upstroke and filters it through the sediment pad on the downstroke. The Food and Drug Administration studies the sediment pads in connection with the inspector's report of sanitary conditions in the dairy plant. Regu-

latory action under the Food, Drug, and Cosmetic Act follows when dirty milk is being used or the plant is operating under insanitary conditions which may contaminate the product with filth.

During the period from March through September, 1946, inspectors of the Food and Drug Administration operating in the mid-continental part of the United States made tests on 272 lots of milk delivered to cheese factories. Forty to 175 cans of milk were sampled in each test, the average being 69 cans; 19,811 cans were examined in all.

The results of each test were recorded as the percentage of the milk containing 0. 0.5 mg., 3.0 mg., 6.0 mg., and 12.0 mg. of sediment. We are confining our discussion of these tests to the milk showing 3.0 mg., 6.0 mg., and 12.0 mg. of sediment since this amount represents a significant quantity of filth and extraneous material. A cross-section of the sediment pads from each test was examined microscopically in the laboratory and the identity of the filth was determined. Generally the sediment consisted of cow manure, various kinds of hair, insects and insect parts, feather fragments, dirt, rust, metal particles, etc.

Table 1 summarizes the data obtained from the 272 inspections. The table lists the number of these inspections broken down in terms of the percentage of such filthy milk in the total cans examined at each inspection. For example, the column under the heading 3.0 mg. shows that none of the 272 tests revealed a complete absence of 3.0 mg. milk, that 26 of the tests yielded from 1 per cent to 9 per cent of 3.0 mg. milk, and that 42 of the tests yielded from 10 per cent to 19 per cent, etc. Similar data are shown for the 6.0 mg. and 12.0 mg. milk.

Table 1 reveals the significant fact that 199 inspections out of the 272 (or 73 per cent of the total) showed some milk yielding 12.0 mg. pads when tested by the bottom-can sampling method. It

TABLE 1  
*Sanitary Classification of Milk Delivered to Cheese Factories, Spring and Summer, 1946*

<i>A. As to incidence of 3 mg pads</i>		
<i>Percentage of Pads Among Total Cans Tested</i>		<i>Number of Inspections</i>
No 3 mg. pads at all		0
1% through 9% 3 mg. pads		26
10% " 19% 3 mg pads		42
20% " 29% 3 mg pads		78
30% " 39% 3 mg pads		72
40% " 49% 3 mg pads		41
50% or more 3 mg pads		13
<i>B. As to incidence of 6 mg pads</i>		
No 6 mg pads at all		26
1% through 9% 6 mg pads		127
10% " 19% 6 mg pads		78
20% " 29% 6 mg pads		21
30% " 39% 6 mg pads		13
40% " 49% 6 mg pads		5
50% or more 6 mg pads		2
<i>C. As to incidence of 12 mg pads</i>		
No 12 mg pads at all		73
1% through 9% 12 mg pads		148
10% " 19% 12 mg pads		36
20% " 29% 12 mg pads		13
30% " 39% 12 mg pads		0
40% " 49% 12 mg pads		2
50% or more 12 mg pads		0

is interesting to note that of the grand total of 19,811 cans of milk examined, 28 per cent showed sediment to the extent of 3.0 mg., 11 per cent to the extent of 6.0 mg., and 6 per cent to the extent of 12.0 mg.

To furnish information about individual tests, the results of a number of representative tests showing a minimum amount of sediment, average sediment, and heavy sediment have been detailed in Table 2. These tests were selected

TABLE 2  
*Typical Tests on Cheese Milk*

<i>Date of Inspection</i>	<i>No Cans Tested</i>	<i>Per cent of Milk Showing Pads</i>		
		<i>3.0 mg</i>	<i>6.0 mg.</i>	<i>12.0 mg.</i>
4/17/46	100	12	1	0
4/ 9/46	50	14	0	0
5/20/46	50	30	8	0
2/ 6/46	42	7	2	1
9/31/46	65	48	6	7
8/ 3/46	87	37	17	10
4/ 7/46	177	25	20	3
4/20/46	90	32	17	26
6/17/46	109	39	27	14
8/23/46	60	19	19	24
5/15/46	100	37	30	20
5/1/46	112	30	7	43

from the 272 described in Table 1 in such a manner that they present a picture approximately the same as the results of all of the 272 tests.

#### OTHER DAIRY PRODUCTS

While sediment tests on milk are made by a very simple technique not involving chemical treatment of the sample, this simple procedure is not generally applicable to other dairy products.

The methods for most other dairy products involve chemical treatment of the sample to facilitate filtration through a sediment pad or filter paper. The methods used on cream for butter making can be performed in the field, but require the inspector to carry with him chemical reagents and equipment for treating the sample. A vacuum pump is necessary. A small proportion of cream samples can be filtered through a sediment pad merely by diluting the cream with hot water. After treatment with hot water, even old cream can be filtered through a coarser medium, but a filtering medium permitting filtration in this manner will not retain the fine particles of sediment. It does retain significant filth elements such as insect parts, and some rodent hairs. Generally, to facilitate filtration of cream through pads, caustic soda is used to neutralize the excess acidity and sodium metaphosphate solution to assist in emulsification. After such treatment the liquid usually will pass through the conventional sediment pad.

Some creams, particularly those containing a considerable amount of mold, will not filter even after treatment with sodium hydroxide and sodium metaphosphate solution. With such creams it is necessary to sacrifice the complete recovery of filth by filtering through a coarser medium or separating the heavy filth by drawing off a part of the material from a separatory funnel and treatment of the remainder by entrapment in a Wildman trap. The Wildman trap

is used for the detection of filth in a wide variety of substances. It consists of a one or two liter Erlenmeyer flask fitted with a rubber stopper attached to the end of a rod which is inserted bottom side up into the flask. When the rubber stopper is brought to the neck of the flask it forms a seal. The material in the flask suspended in water or other liquids is thoroughly shaken with a small amount of gasoline or other oily material. The particles of gasoline attach themselves to the filth substances and bring them to the top of the liquid. The gasoline layer together with a small part of the aqueous layer is poured off after trapping in the neck and is filtered. The residue of filth and extraneous matter on the filter is then available for microscopic examination.

Smaller amounts of filth and extraneous matter are usually found in cream than in the milk from which it is separated, since there is a tendency for elements of filth to follow the skim milk rather than the cream through the separator. However, since cream is held longer on the farm and is manipulated as it passes through the cream station to the creamery, it is particularly subject to contamination after separation. The microscopic examination of the sediment pad is most important when dealing with cream. Microscopic examination of cream pads sometimes reveals small maggots resulting from fly contamination, as well as other filth elements.

Recently developed methods are now available for separation of filth and extraneous matter from a number of finished dairy products such as cheese, dried milk, evaporated milk, and butter. Two general principals are involved in these methods. The first class of methods embraces products which can be emulsified by chemical treatment with or without digestion with pancreatin. The emulsified sample for quantitative estimation of filth is filtered through



paper. The second class of methods involves sedimentation and the use of the Wildman trap described above. It should be reemphasized that there is no universal method for all dairy products and diversified methods are frequently applied to the same type of dairy product. The method of choice for a particular sample is the one which minimizes the damage to the filth present and which results in near quantitative recovery of the filth. At times these two objectives are not completely compatible, and it becomes necessary either to sacrifice complete recovery or to endanger the filth elements present.

The separation of filth or extraneous matter from finished dairy products is futile unless the identity of the elements of filth is established by microscopic examination. While this phase of the determination is also important in raw materials such as milk and cream, it is fundamental to proper interpretation of filth analyses on finished products. When large amounts and impressive types of filth are found in dairy products the determination speaks for itself and there is little need for additional evidence to support the conclusion that the product is filthy. However, it is more usual that the sample reveals very small amounts of filth, since practically all dairy products manufacturers strain or filter their raw material, and in these circumstances it is valuable to use additional data in interpreting the results. In interpreting the significance of a filth analysis, we should study not only the results on the particular sample involved, but all other samples from the same source together with sediment tests of the raw material and the report of the sanitary inspection of the place of manufacture.

Details of methods of analysis have not been given in the above discussion since many of the methods discussed have been published in the book of

*Methods of the Association of Official Agricultural Chemists*. These methods will also be published in the forthcoming edition of the American Public Health Association Methods.

The Food and Drug Administration has extensively used the methods described above in the enforcement of the Food and Drugs Act. The use of these methods in connection with factory investigations has furnished evidence to support an extensive regulatory program. Many seizures, prosecutions, and injunctions based on the application of sediment tests to both raw materials and finished products have been brought to a successful conclusion. In presenting such evidence to the courts, it is frequently valuable to prepare exhibits of filthy substances found in the food for presentation to the court. Milk and cream sediment pads are particularly valuable exhibits.

#### SUMMARY

1. Filth and extraneous matter in milk can be determined easily in the field, and at the present time such tests are widely used both by the industry and regulatory officials on milk for use in manufactured products.
2. Two hundred and seventy-two recent tests performed by inspectors of the Food and Drug Administration show that considerable quantities of milk containing large amounts of filth are received by cheese factories.
3. Sediment test methods for cream used in butter making are available for use in the field and in the laboratory.
4. Methods have been developed for the determination of filth and extraneous matter in cheese, evaporated milk, skim milk powder, etc. These are laboratory methods designed for use on finished dairy products.
5. The microscopic identification of filth elements is a very important part of any determination of filth and extraneous matter in dairy products.

# The Medical Social Worker in a County Health Department

A Coöperative Plan Between a Health and Welfare Department

JESS B. SPIELHOLZ, M.D., AND IVA VAL BRAKEL

*Health Officer, Bremerton-Kitsap County Department of Public Health,  
Bremerton, Wash.; and Supervisor of Social Services, Kitsap County  
Welfare Department, Bremerton, Wash.*

OFFICIAL health and welfare departments frequently face mutual problems and responsibilities. Their recognition and an approach to their solution by utilizing the combined abilities and interests of the professionally trained personnel of both organizations would seem to be a desirable way of bringing increased service to the community. This is especially true in applying the services of medical social workers, whose contribution to the success of health department programs is just beginning to be appreciated. We propose to tell how, in one county, coöperative functional planning has resulted in a better working relationship and greater accomplishment.

## DESCRIPTIVE

Kitsap County, in the State of Washington, covers an area of 394 square miles bordering on Puget Sound. Although there is some fishing, lumbering, and dairy farming, the economic life of this area centers around the Puget Sound Naval Base, a major installation located in Bremerton, the largest city in the county. As a result of war activities, the population of the county rose rapidly from the 1940 census of 35,000 to the present estimate of 160,000. Within Bremerton are concentrated at least 75,000 persons, a growth

from 15,000. This population is predominantly white except for about 5,000 Negroes and 500 Indians; it represents an influx from almost every part of the country.

## THE HEALTH DEPARTMENT

The Health Department, functioning jointly for both city and county, was established as a full-time unit in 1941. Since 1943 it has been housed in the Franklin D. Roosevelt Memorial Hospital in Bremerton, a community hospital built with Lanham Act Funds and sponsored by the County Board of Commissioners. Because of its intimate physical relationship with the hospital, planned from the very beginning, the Health Department enjoys adequate facilities including use of the laboratory and x-ray equipment.

The Division of Sanitation enforces city and county regulations, including milk and restaurant codes based on U. S. Public Health Service standard codes, as well as adequate sewage and plumbing ordinances. It supervises sanitation of schools, houses of refuge, and convalescent homes.

The Division of Nursing conducts a generalized public health nursing program, including some bedside nursing. This was instituted in 1943 to meet some of the needs of an overcrowded

population and a relative shortage of practising physicians and nurses.

Regular tuberculosis, venereal disease, and orthopedic clinics are conducted at the Health Department. Immunization clinics are held periodically throughout the county, as are a few "mother-nurse" conference groups, in limited areas.

#### THE WELFARE DEPARTMENT

The State Department of Public Welfare was created by a Legislative Act in 1935. It is responsible for administering and supervising all programs through local county welfare departments. The Divisions for Children, Old Age Assistance, Assistance for the Blind, and General Assistance were established by law. The medical care program thus far has not been separately established by law.

County welfare departments are responsible for administering the total program in their respective communities. The Kitsap County Welfare Department functions under an Administrator with a staff of 17 professional and 7 clerical workers. It is the only county in the State of Washington which has medical-social workers on the staff. The medical-social work program as it functions with the Health Department is also unique.

Until January, 1943, the local health department was administratively part of the Welfare Department. This involved chiefly budgetary control and accounting practices. Tuberculosis hospitalization was also a Welfare Department responsibility. As a result of acts of the State Legislature, the two departments became completely separated and tuberculosis control and hospitalization was transferred to the Health Department. Medical care of relief recipients continues to be a Welfare Department program.

A medical-social worker was assigned to the Kitsap County Welfare Depart-

ment in December, 1943, to work with the medical care program. Her first assignment included development of medical-social service within the community, hospital admissions, and nursing home placements. Early in 1944, the County Public Health Director asked that medical case work services be made available to female patients of the venereal disease clinic and to tuberculosis patients.

In the early planning of this program it was recognized that medical case work service to such special groups, given by a welfare worker in a Health Department clinic setting, gave opportunity for a fresh method of approach. But it was agreed that continued service would depend upon the need for case work services evidenced by the patients as well as upon the recognition of the value of such service by the Health Department workers involved. Consultation with a medical-social worker was to be on a selective referral basis. Although the interests of the Health and Welfare Departments touch at many points, the chief areas of function of the medical-social worker in relation to the Health Department program have been centered about tuberculosis, venereal disease control, and orthopedic services.

#### VENEREAL DISEASE CONTROL

Two clinics a week are held at the Health Department offices for the diagnosis and treatment of venereal diseases. Patients come in through contact investigation, by direct application, upon referral of private physicians, and through the activities of public health nurses. There is no charge.

The venereal disease patients are seen by a medical-social worker after their clinic visit in a private interviewing room near the examination rooms. Facilities for privacy are adequate and the patient is given any length of time he wishes to discuss the problem involved. In the venereal disease clinic it

has been the practice to see women patients generally in the younger age group; that is, under the age of 25 years. Referrals are made by the physician or the clinic supervisor of nurses who has responsibility for interviewing patients and recording medical history. The majority of the group have been found to have problems with which they desire medical case work assistance and are carried on a case work basis as long as a need seems indicated.

Experience in the venereal disease clinic has shown invaluable opportunities for helping the patient confronted with the adjustment involved in venereal disease and its treatment. The patients showed varying degrees of guilt, and have considered it a moral problem in many instances, with a tendency toward self-blame. The emotional element often has been so intense that, without case work services, there might have been serious personality conflicts.

The majority of the 87 patients seen were comparatively new to the community and had come for wartime employment. Financial problems were almost nonexistent. While some of the group were unmarried, more were married, divorced, or separated. Of the group that was married, most had husbands in the service. Few housewives or students were represented, most of the girls being employed as waitresses or in the Puget Sound Navy Yard as war workers. Approximately one-fourth of the group had an eighth grade education or less. Thirteen were high school graduates and only three had any collegiate training. The largest number was concentrated in the age group between 19 and 24 years, although the age range was from 13 to 55 years. Fewer than one-fourth of the patients were of other than the white race. Most were from the mid-western states and had come from rural areas. The paramount problem centered around anxiety and guilt feelings related to their venereal

infection. As a group, they did not have meaningful family relationships and generally showed emotional immaturity.

In analyzing case work contributions, it is felt that the patients on a whole needed help. They seemed poorly prepared, however, either by life or experience to use any help. Promiscuity and sophistication served as a protection hard to break through. In establishing a meaningful relationship, the case worker has to meet the requests for tangible help and prove to the patient an interest in him as a person. It is believed that case work treatment cannot change to a marked degree the underlying conflicts in the patient, but by meeting dependency needs, accepting him as an individual, and giving support to his ego, he can be helped to function with less difficulty in his relationships with other people.

#### TUBERCULOSIS CONTROL

A chest clinic for the diagnosis and treatment of tuberculosis is held once a week at the offices of the Health Department. Medical services are given by a tuberculosis consultant. Patients and contacts are referred by private physicians, public health nurses, and as a result of an extensive miniature chest x-ray survey conducted jointly by the Health Department and the Tuberculosis League. In addition, a large proportion of the chest x-rays taken by private physicians are referred to the consultant for interpretation. The county maintains a 50 bed tuberculosis sanatorium under the administration of the Health Officer.

Each patient who is diagnosed as having active tuberculosis is referred to the medical social worker. This affords the patient an opportunity to express his feelings concerning the physician's diagnosis and recommendations. Frequently the patient is so upset emotionally that he finds it difficult to accept the treatment plan. He may resist

treatment for many reasons, but particularly because of concern about responsibilities for his family.

The medical-social worker attempts to relieve him of some of the anxiety and encourages him to talk about his attitude toward his illness so that she may determine the factors which to him appear paramount. If it is evident that the patient is confused in the medical interpretation given by the physician, the social worker usually requests the public health nurse or the physician to talk further with him to clarify his thinking.

The medical-social worker uses the first interview to explain in detail the services available for his care. She learns something of his financial ability to meet the medical needs for himself and also to provide for his family. It is always carefully explained to the patient that there are resources to meet his needs. When he leaves her office he has all the assurance that adequate assistance is available. If sanatorium care is indicated, she prepares him for his experience there, explaining visiting hours, what he will need in clothing, mentioning the occupational therapy and recreational facilities.

Financial planning with the patient is important, since the patients are accepted as free, part-pay, or private patients for sanatorium care. The problems confronting the tuberculous patient are much the same as those confronting any patient in need of long care away from the home. Needs presented often include foster home placement of children, or some form of public assistance for dependents.

Those patients showing a need for continued case work services are seen in the County Sanatorium by the same worker who sees them in clinic. She attempts to obtain sufficient information from the patient and other members of his family to get a rather complete picture of the patient as a person. Any

social problems which are revealed in securing the social study, particularly those that may aggravate the patient's condition, are alleviated as far as possible. In addition, she works with the patient's family to give them understanding regarding the patient's anxiety, and explains the important part that the family's attitude plays in his recovery. The medical-social worker's goal is to give as much supportive assistance as possible in an effort to help the patient make mental and emotional adjustments, thereby hastening his recovery.

To effect continuity in the treatment plan, the social worker shares with the medical and nursing staff the social problems which are a concern to the patient and his progress in social adjustment.

Lines of responsibility have been fairly well delineated. The public health nurse assumes responsibility when the major problem is health, such as contact follow-up and case finding. The medical-social worker offers case work services to the patients in the clinic, the home and in the sanatorium.

#### ORTHOPEDIC SERVICES

In April, 1941, service for crippled children was transferred from the State Department of Social Security to the State Department of Health with the understanding that the county welfare departments would do the social studies for the health departments. The State Department of Health has been conducting diagnostic clinics and providing for orthopedic care for certain children coming under the Crippled Children's Program. These clinics have been held several times a year in Seattle.

After the child has been examined by an orthopedic physician at a diagnostic clinic and treatment is recommended, the County Health Officer is notified by the State Department of Health of those children who are in need of treatment. A medical-social worker then

makes a social study based on information secured during a home visit. This is forwarded to the medical-social worker in the State Department of Health. This material is used by her in case work services with the child during his hospitalization period. After the child returns home, the medical-social worker and public health nurse continue working with him and his family in an effort to assist with any medical-social problems or nursing problems relating to the child's orthopedic condition.

Within the past few months an orthopedic clinic has been established in the County Health Department through the joint coöperation of the Health Department, the local chapter of the Poliomyelitis Foundation, and the County Medical Society. Consultant orthopedists from Seattle visit this clinic. All age groups are seen. Patients under 21 coming under the Crippled Children's Program and cases of poliomyelitis are seen free of charge. Private patients are also referred by practising physicians on a private fee-for-service basis. The Medical Director has requested the services of a medical-social worker in this clinic.

#### CHILD HEALTH

Mutual problems within the field of child health arise in connection with examination for placement in foster homes and supervision of the sanitation of these homes. The services of the Health Department sanitarians are available at the request of the social worker in investigating the environment before placement of these children.

#### ADMINISTRATION

Programs involving joint action are planned jointly by the administrators of the two departments or by their designated associates. Thought is given at the very beginning of the planning of any new program to the clarification of any overlapping administrative respon-

sibility. The function of the medical-social worker is carefully delineated. From there on supervision of the worker is provided by the Welfare Department supervisor. At the same time, the worker, while she participates in the joint program, has a definite responsibility to the Health Department director for medical interpretation in the individual case. She represents the Health Department to the patient until such time as a problem indicating Welfare Department responsibility enters into the picture. The patient or his family is seen by the case worker at the Health Department offices or the sanatorium.

An active program of staff education has been necessary in order to correlate the activities of the Welfare and Health Departments. Joint staff conferences of nurses, sanitarians, and medical-social workers have been found effective. Reciprocal orientation of new staff members of each department to the activities of the other has now become a routine procedure. The working relationship of the individual public health nurse and medical-social worker has been considerably strengthened so that each now avails herself more frequently of the services of the other.

The Health Department, which maintains student nurse affiliation, has included as part of the experience of the student nurse the various aspects of this interrelationship between the two departments, both through formal seminars with Welfare Department supervisors and by direct observation and participation. A medical-social worker has been asked to give a one hour class for each group of students, showing the working relationship between the public health nurse and the medical-social worker in the public health clinic. These classes have proved very interesting and informative for us and we hope for the student nurses. These students

come to the class oriented in the understanding of the function of the medical-social worker in a hospital. The problem is one of relating this information to the work in the public health clinic. It is sometimes a little difficult at first for them to visualize the medical-social worker attached to the County Welfare Department, giving case work services outside of the hospital. Brief illustrative case material has been helpful in making the interpretation to the student nurses and the hour has usually ended with the nurses thinking of patients in their own field work case load who might profit by the medical case work service.

#### PUBLIC RELATIONSHIP AND ATTITUDE

The services of the social worker have been accepted as part of the services offered by the Health Department to the patient. This was not always true when the worker was introduced as a member of the Welfare Department and interviewing was done at the Welfare Department offices. The medical profession, too, is accepting the role of the medical-social worker. This is especially true in connection with problems presented by tuberculosis control. It is becoming progressively more apparent, however, in other fields of medical interests. For example, in drawing up a plan for a definite understanding between the Medical Society and the Health Department in relation to the activities of the venereal disease clinic, the medical-social worker was included.

#### CONCLUSION

The joint program was initiated on an experimental basis over two years ago, and results have been so gratifying that it is now fully accepted by both departments. They are deriving mutual benefit and satisfaction in meeting social and medical problems in the community together.

The County Welfare Department realizes that this joint sharing of community responsibility with the Health Department has had definite value in developing its medical-social program. It has provided an opportunity for its medical-social workers to work directly with the County Health Director and have the benefit of his medical supervision in the venereal disease clinic, and with the chest consultant in the sanatorium and tuberculosis clinic. This has broadened their experience and assisted in their professional development. Thus the medical-social worker and the nursing staff have a much deeper appreciation and respect for each other's profession. This could not have been accomplished except through day by day working relationship, each making an effort to understand the function of the other.

A review of the joint program leads to the conclusion that both departments have gained by the close working relationship. The Health Department has had placed at its disposal the services of trained medical case workers and has thereby been able to incorporate into its program consideration of the social side of disease and of public health problems.

Equally important, it has drawn the staffs of the two departments more closely together so that each has a better understanding of what the other professional worker is trying to do. Coöperative solution of joint problems is no longer a theoretical ideal. Through closer working with the medical staff, the social worker is better able to appreciate the social needs in relationship to the medical needs and, because referral to her is immediate, to take immediate steps to meet these needs. The Health Department and the medical profession are coming to recognize the case worker as a person whose functions go far beyond financial clearance.

# Health and Social Statistics for the City\*

HALBERT L. DUNN, M.D., PH.D., F.A.P.H.A.

*Chief, National Office of Vital Statistics, U. S. Public Health Service,  
Federal Security Agency, Washington, D. C.*

FOR the last two years, Esther Wright of the staff of the National Office of Vital Statistics has been devoting full time to the program of small area statistics in cities. The plan of operation has been to assist in every way possible Howard Whipple Green of Cleveland, W. Thurber Fales of Baltimore, and Leon Truesdell of the Bureau of the Census to reduce to writing and graphic form their extensive "know-how" in this subject. This should make it possible for other workers to benefit from their experience and to carry on this important activity in the other large cities of the country. With the reissuance of the *Census Tract Manual*, which I understand will soon be available, and with the completion of various other materials and exhibits, this phase of the program will soon be an accomplished fact.

During these last two years, I have been questioned many times why vital statistics was interested in this work. "What has it got to do with vital registration?" "How will it aid the tuberculosis program?" "Why are vital statistics consultants surveying the present use of census tracts in various cities?" "Why are they approaching businessmen concerning their need for census tract data?"

The answer to all such questions is a very simple one. We are interested in people. By this, I do not mean an interest focused primarily on people as cases of tuberculosis or syphilis or heart disease; or an interest in families as social welfare problems or as potential trade customers; or an interest in youth as juvenile delinquents. What is meant is that we have an interest in people and in families as such—in their characteristics—in the way they are distributed throughout the city. We realize that the vital statistics we publish will always have a limited usefulness and significance unless they are related closely to the way people live, to the kind of jobs they have, and to the problems they face.

A basic statistical knowledge concerning the people themselves should underlie all subject-matter programs. Yet in many, many instances, programs are devised which are faulty because of insufficient knowledge concerning the people at whom they are directed. For example, schools have sometimes been placed where there are not enough children to use them; cities have occasionally laid out development plans without an awareness of the degree of population growth to be anticipated; businesses have charted their future courses at times without taking into account the supply of workers which they need or the potential customer market. Even world-wide problems such as those involving labor supply and job opportuni-

---

\* Presented before the Vital Statistics Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 13, 1946.



ties, food resources, immigration controls, and numerous others have had to be acted upon without sufficient knowledge of population factors. Perhaps a hopeful sign for the future is the recent clear-cut recognition by the Social and Economic Council of the United Nations that a Population Commission is necessary to cope with just such deficiencies.

Up to the present time, the primary national interests in demographic or population analysis have centered in universities or foundation supported organizations. Scripps, Princeton, Milbank, Hopkins—these are the names that come to mind. The Bureau of the Census has, of necessity, devoted most of its energies to the obtaining of population data rather than to the analysis of these data. National, state, and city planning commissions, though usually inadequately financed, have made a beginning. Little has been done by the state health departments or vital statistics units in the field of population analysis. A few counties have shown interest.

When it comes to cities, however, all of us recognize two in particular which have a clear-cut focus of population data. They are Cleveland and Baltimore. It is due to the efforts of Howard Whipple Green and W. Thurber Fales that we are primarily indebted for the brilliant pioneer work which has set examples of what can be done. In addition, Birmingham, Chicago, Cincinnati, Detroit, Los Angeles, Milwaukee, New York, Pittsburgh, and several other cities have made considerable progress along these lines.

The technique of creating a focus for population facts in large cities has been simplified by the existence of population data tabulated in census tracts. Census tracts are small areas into which large cities are divided. Data collected by the Bureau of the Census are tabulated by these small areas. They have definite and permanent boundaries.

Each tract includes a population of between 3,000 and 6,000. It is fairly homogeneous with respect to race, nativity, economic status, and general living conditions.

In general, all population items were tabulated by race and nativity and housing items, by occupancy and tenure and color of occupants, wherever applicable. This is true of both published and unpublished tabulations. Tabulated but unpublished items for census tracts include: nativity of minor races, school attendance, industry groups of employed workers 14 years old and over, exterior material of residential structures, number of rooms of dwelling units, lighting equipment, cooking fuel, water supply, bath, tub or shower, furniture, and rent.

In 1940, census tract data were made available for 60 of the larger cities of the country. The existence of population tabulations by census tracts means that a reasonably complete knowledge of the people and families in a large city can be obtained by summarizing and coordinating all such facts for a few score census tracts and by keeping these facts *up to date*. Vital statistics is an important part of this task since the current allocation to these tracts of births, deaths, marriages, and divorces is needed to revise the once-in-ten-year census population picture throughout the interim census period.

City health departments, like other city agencies, have two basic uses of census tract data: (1) health statistics compiled on a census tract basis serve to show the geographical distribution of health problems; and (2) health statistics compiled on a census tract basis may be related to other social and economic factors available by census tract. Both of these uses are sometimes expressed in the larger health area units by reassembling the census tract data.

In recent years, public health administrators generally have adopted the philosophy that public health programs

are best administered in large cities through a neighborhood health center plan. These health centers are usually the administrative units of health areas. Generally, a health center area is designed to include a population of approximately 25,000. The health area boundaries should be contiguous with census tract boundaries. Data may be tabulated by tracts and data summarized by health areas.

Homogeneity in population characteristics is difficult to maintain in a population grouping of 25,000 or more persons. It may frequently happen that a particular health problem will exist in only one small section of a health area or it may happen that a health problem will arise in two contiguous census tracts which are in different health areas and thus require the coöperation of the two health officers concerned. Finally, it should be noted that population and housing data can be compiled for health areas only if the health area represents combinations of census tracts for which census data are available.

A second problem of administration lies in obtaining citizen participation in health programs. It is very difficult to get all the city interested in a problem localized in only one section of the city. It is relatively easy, however, to obtain community interest and action on problems affecting each small community. This, of course, is one of the reasons for establishing community health centers, but it must be remembered that it is possible to compile all the pertinent data for the community only if the community is a grouping of census tracts. It should also be emphasized that a health area embracing a small number of census tracts is much more apt to have a fairly homogeneous population with common interests than a health area drawn with no reference to base population data.

Spotting births, deaths, communi-

cable disease cases, and nurses' visits on a tract map shows the health administrator where his "business" is. Mothers' classes should be organized in areas where births are most frequent. Special classes and special preventive measures should be taken in areas where stillbirths and infant deaths predominate. Well baby clinics should be located in the areas where the babies live. Venereal disease and tuberculosis clinics should be located in the areas where venereal disease and tuberculosis cases are clustered most. Similarly, public health education programs on venereal disease and tuberculosis should be stressed in these areas. Special preventive measures should be taken in areas where certain other communicable diseases occur. Accident prevention programs should be stressed in areas where accidents occur and areas where persons who are involved in accidents reside. Out-patient hospital clinics should be located in areas where the people who use them reside. Nurses' areas should be designed according to the distribution of demand for nurses' services. Housing inspections and inspections of food establishments are presumably made on a city-wide basis. It is a good idea to design inspectors' areas by census tracts and to keep inspection records on this basis. "Problem areas" may be easily spotted and special attention can be given these areas.

There are other possible uses but each should be studied carefully. Prenatal clinics, for example, might be established in areas where births predominate. Certainly a study of population trends and an analysis of births by residence should be one factor in the considerations of selecting sites for such clinics. On the other hand, it may be necessary to install such clinics where hospital facilities already exist. Similarly, facilities for the care of crippled children should be established where the greatest number of persons needing such

care live, but the location of existing facilities will probably be the final determining factor.

As important as it is to have information on the geographic distribution of health problems, it is equally important to be able to relate health phenomena with other social and economic conditions. This can be done by analyzing health data on a census tract basis. As previously stated, census tracts are designed to include relatively homogeneous populations of approximately 5,000 persons. A wealth of data on age, race, nativity, sex, education, employment, housing conditions, and economic status are available for each tract from the federal census. Locally collected data on housing, recreation, juvenile delinquency, school attendance, and so on may also be compiled on a census tract basis. It is a truism that two widely separated tracts having the same living conditions represent more of a community of interest than two contiguous tracts widely different in economic status.

The Committee on Census Enumeration Areas of the American Statistical Association has illustrated as scientific exhibits two of the uses of tabulations of data by census tract.

The first exhibit demonstrates the low ratio of toxoid inoculations to births in Baltimore. By means of this knowledge, the city health department was able to concentrate its efforts on an intensive immunization campaign. The second exhibit sets forth the relation between health and economic factors in Cleveland.

One more use of census tracts should be noted. Census tracts provide an excellent base for sampling. Census tract data also provide sufficiently detailed information for small population groups to form a basis for selecting small areas having specified characteristics for intensive study.

It is not necessary to make frequent

elaborate tabulations by census tract. In fact, such a procedure should be avoided since tract tabulations might then become an unnecessary burden on the health department and eventually be dropped altogether for this reason. Certain basic records should be routinely coded by tracts. These include births, deaths, stillbirths, communicable disease cases, nurses' visits, and residence of persons attending various clinics.

Monthly tabulations of total births, deaths, stillbirths, and communicable disease cases should be made by tracts but it is probably unnecessary to make any detailed tabulations this frequently. More detailed tabulations should be made annually. These might include births by race, total stillbirths by race, total deaths by race and age (5 age groups only). Deaths from selected causes should also be tabulated by race, sex, and age. These causes should include the ten leading causes and any others in which there is special interest. A tentative suggestive list includes tuberculosis, pneumonia, diseases of the circulatory system, cancer, diabetes, nephritis, cerebral hemorrhage, accidents, meningococcus meningitis, poliomyelitis, rheumatic fever, maternal deaths, and, of course, infant deaths. Reported cases of certain communicable diseases should also be tabulated by race, age, and sex. Nurses' visits should be tabulated by type of case and type of service. Clinic visits should also be available by type of case and race. More detailed tabulations than these should be made only for special studies. It is important, however, that all records which might be analyzed by tracts should be routinely coded by tract. This coding operation takes very little time if done regularly, and punching tract identification along with other information also adds little to the regular work.

Before closing, I should like to point out that the staff of the National Office

of Vital Statistics fully recognizes the fact that a focus of population statistics in the large city can be created in other types of organizations than in city health departments. There is no doubt in my own mind, however, that the best focus for such a population register will usually be found to be the vital statistics section of the city health department. This conclusion is based primarily on the consideration that such a population focus needs: (1) an office staff with knowledge and skills in indexing, coding, and statistical analysis, (2) a budget sufficient to furnish freely the population statistical services to organizations needing them, and (3) an

adaptation of the current flow of vital records for the purpose of keeping the population register up to date. Likewise, it is my opinion that both the health and vital statistics responsibilities of the city health office can be met more adequately by such a development.

The future program of the National Office of Vital Statistics includes promotion of the establishment of population registers in all of the large cities of the country. In coöperation with the Bureau of the Census, the state health offices, and other interested organizations and individuals, we hope to implement this program through training and demonstration projects.

---

## Public Health Coöperation in Student Nurse Recruitment Program

The Student Nurse Recruitment Program for enrolling 45,000 student nurses in the nation's 1,300 schools of nursing in 1947, being conducted by the American Hospital Association, the Advertising Council, Inc., the American Red Cross, and national nursing organizations, was briefly outlined in the *May Journal*, page 630.

The campaign stresses positive aspects of nursing—the hundreds of interesting jobs open in hospitals and in non-hospital fields, the higher pay and shorter hours now generally prevailing for nurses, the high standards of education offered at low cost, the value of nurse training as preparation for a career, marriage and family and community life, and the high respect in which the nursing profession is held by the community.

Programs in high schools, information centers for prospective student nurses, conducted tours of the local hospital or school of nursing for high school students, talks by nurses recruitment officials before civic, social, and business

groups are planned as part of the local recruitment programs.

Ways in which local public health groups can assist in recruiting student nurses include sponsorship of advertisements in newspapers or spot announcements over local radio stations in coöperation with a local hospital, school of nursing, or nurse recruitment committee. Proofs of advertising mats prepared by the Advertising Council, Inc., have been sent to schools of nursing. In coöperation with nurse recruitment officials, local public health groups might prepare a brochure or booklet on nursing, assist in arranging nursing education meetings of various clubs and organizations and high school groups, operate an information booth on nursing in a department store or some other central place.

Public health officials interested in assisting the 1947 Student Nurse Recruitment Program are urged to get in touch with nursing schools and hospitals for further information about local nursing needs and recruitment efforts.

# American Journal of Public Health

## and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 37

June, 1947

Number 6

### Editorial Board

REGINALD M. ATWATER, M.D.  
*Chairman and Managing Editor*

LEONA BAUMGARTNER, M.D.  
MARTIN FRONISHER, JR., D.Sc.  
PROFESSOR JOHN M. HENDERSON

RALPH S. MUCKENFUSS, M.D.  
STUART MUDD, M.D.  
RAYMOND S. PATTEPSON, PH.D.

C.-E. A. WINSLOW, DR.P.H.

C.-E. A. WINSLOW, DR.P.H., *Editor*

AUGUSTA JAY, *Editorial Associate*

## WHAT IS HEALTH EDUCATION?

HEALTH Education is the newest of the professional specialties to be developed as a basic and essential element in the public health program. In the 19th century, the sanitarian and the bacteriologist were the dominant figures in the field. In the early 20th century, the physician and the nurse came into the picture. Today, our Committee on Professional Education has prepared detailed statements of educational qualifications for thirteen different types of specialists—with more to come. In none of the areas of service has development been more rapid than in that of health education. Ten years ago there were perhaps a dozen recognized experts of this kind in the United States. Today the accepted minimum standards for local health service list the health educator along with the administrator, the nurse, the sanitarian, the statistician, and the laboratory expert as a fundamental element in every program.

It seemed to the Editor desirable to see what all this shouting was about. We have, therefore, invited fourteen leaders in health education, approaching the subject from the differing viewpoints of the health officer, the physician, the nurse, the health council executive, the faculty member of the school of public health, the expert in school health, and the U. S. Public Health Service, to prepare brief and succinct answers to the question, "What Is Health Education?" The resulting symposium is presented—with much satisfaction—as the special review article in this issue of the *Journal*.

Frankly, we expected fireworks; and we are agreeably disappointed in this expectation, for the display is one characterized by much light and little heat.

Dr. Bauer and Miss Connolly emphasize the broad scope of the process of health education and the fact that it includes the impact of the whole of life's experiences, as affected by a wide variety of forces bearing on the health knowledge and practices of the individual. Dr. Dublin stresses the important rôle of the practising physician, whose direct contacts with the individual are central and determining in their influence; and Miss Fox elaborates the kind of personal guidance which is the prime factor in the activities of the public health nurse. Several contributors point out that among the forces which mould the health

consciousness of the public are many which are positively harmful in their trend, such as many forms of commercial advertising (Dr. Bauer), and the propaganda of cultists (Mr. Marquette). Dr. Derryberry notes that a hurried and inhuman clinic contact or a casual and superficial health examination may nullify all that has been accomplished by arduous efforts to cultivate a sense of the preventive service which the physician can and should render to the public.

The theme most commonly stressed by our contributors is that the object of health education is to mould conduct and that it is valueless unless it actually changes the habits of the individual. This is emphasized by Dr. Bauer, Dr. Derryberry, Mr. Green, Miss Jean, and Dr. Peter. Miss Fox and Mr. Green remind us that if success is to be attained, the program must be carefully planned so as to be purposefully directed at a given group, for the attainment of specific results. Mr. Groom underlines the importance of brevity and compactness and simplicity in producing maximum results with minimum effort. Dr. Bundesen cites the admirably efficient way in which the resources of a great city health department may be focused on the attainment of specific ends, such as immunization or infant care.

Health education, however, is something more far-reaching and more deep-seated than the important task of securing compliance with particular procedures. That is—after all—training, not education in the true sense of the term. Dr. Morgan points out that we must cultivate a general habit of mind as well as inculcate specific practices; and that in the field of public health this habit of mind must be grounded in a broad and fundamental social philosophy.

Finally, Dr. Nyswander and Dr. Wilson strike what is perhaps the most fundamental note of all. They point out that the important thing is "learning" not "teaching," and that conduct is not controlled by intellectual processes alone but by motivation. Unless the learner really *wants* what he has learned to be good, he will not seek it. The essence of a change in behavior is motivation, and motivation comes only through experience. The experience may be "learning by doing" or it may be "learning by feeling." It may involve a physical act leading to habit formation or an emotional experience such as may result from hearing a speech or seeing a poster. What is essential is that the learner—through act or feeling—shall himself make a contribution to the process. Without such active participation on his part, the seed will fall on stony ground.

## A NATIONAL NERVE CENTER FOR PUBLIC HEALTH LABORATORY SERVICE

A YEAR ago (July, 1946) the activities of the Office of Malaria Control, which proved of such inestimable value during the war, were crystallized in what it is hoped may be a permanent form, through the establishment of a Communicable Disease Center of the U. S. Public Health Service at Atlanta, Ga. As the name of the new organization indicates, its scope of interest will be broadened to include any or all communicable diseases, although major emphasis will at first continue to be in the field where insect vectors or animal reservoirs are of importance. The functions of the center will include research and evaluation, training of personnel, and emergency service to communities where special problems may arise.<sup>1</sup>

One of the most important elements in the program is the creation of a Division of Laboratory Services, described by Seward E. Miller at the Cleveland meetings of the American Public Health Association last fall.<sup>2</sup>

This division will fulfil three major functions: In the first place, it will continue intensive research on such problems as the serology of rickettsial diseases, precipitin tests for the type of blood present in the stomachs of mosquitoes, and the study of neurotropic viruses (carried on at the laboratory established at Birmingham, Ala., for rabies research by the Rockefeller Foundation). It hopes to extend its researches to the evaluation of the performance of various public health laboratory techniques (along the lines already established by the U. S. Public Health Service in connection with the serology of syphilis). Such studies are to be carried on in close coöperation with appropriate committees of the American Public Health Association and of the Conference of State and Provincial Public Health Laboratory Directors. They will not be directed toward any official U. S. Public Health Service standards but are planned as aids to the laboratory workers of the country in formulating and standardizing their own procedures.

A second function of the division will be direct consultation service to individual laboratories which may call for assistance. This may involve emergency epidemic aid where necessary; but will ordinarily consist in response to requests for advice as to particular procedures or the temporary assignment of laboratory personnel for the purposes of solving technical and administrative problems or improving techniques and practices. It is hoped that ultimately such service may be extended into the fields of biochemistry and hematology as well as microscopy and cultural and serological techniques. The division will also be concerned with the vital problems of laboratory design and equipment, working in coöperation with the new U. S. Public Health Service Division of Hospital Services. Federal assistance will be available, under an Act of the last Congress for public health laboratories, as well as for health centers and hospitals. The Committee on Laboratory Quarters and Equipment of the Conference of State and Provincial Public Health Laboratory Directors has been asked for aid in establishing minimum standards for such laboratories. When these standards are established, a number of designs and plans for such laboratories will be prepared.

A third important function of the Atlanta Center will be training of personnel. Progress along this line has already been instigated by establishing in Atlanta parasitology laboratories composed of equal units of helminthology, protozoölogy, and medical entomology. The staff of these laboratories is busily engaged in fulfilling the request of the American Society of Tropical Medicine that the U. S. Public Health Service give short refresher training courses in the laboratory diagnosis of tropical diseases. To date, five such 6 week refresher courses in the laboratory diagnosis of parasitic diseases have been taught, with particular emphasis upon malaria, amebiasis, leishmaniasis, schistosomiasis, echinococcosis, filariasis, and hookworm disease. The courses are given free of charge to qualified public health laboratory workers and now, by arrangement with the Veterans' Administration, about 12 or 13 students in each of our succeeding classes will be from the technical workers in the laboratories of the various Veterans' Hospitals' throughout the country. The educational program has been broadened by mailing out special teaching materials to some 173 laboratories which have expressed an interest in the project. This service was initiated with malarial smears but is being extended to include other parasitic materials and those relating to various types of communicable diseases. The participating laboratories will retain these slides and specimens, and thus will ultimately accumulate a considerable collection of demon-

stration and teaching material for reference study and for the training of new employees.

The experiences of the war have broadened our vision to recognize that "tropical diseases" or "exotic diseases" are diseases which occur most extensively in other countries but which may also, not infrequently, be present in our own land. The mechanisms developed to cope with temporary problems of the war emergency have been continued and expanded at the Atlanta Communicable Disease Center to provide a most valuable element in our permanent health defenses.

#### REFERENCES

1. Andrews, J. M. The United States Public Health Service Communicable Disease Center. *Pub. Health Rep.*, 61:1203 (Aug. 16), 1946.
2. Miller, S. E. Laboratory Technological Service Program of the Communicable Disease Center. Paper presented at the Seventy-fourth Annual Meeting of the A.P.H.A., November 11, 1946.

## AN INGENIOUS YARDSTICK FOR MEASURING HEALTH STATUS

THE Editor has recently come across a new device for stimulating a local sense of unfilled needs in public health which produces somewhat striking results. How sound it is, must be left for the expert statisticians to decide.

This procedure has been introduced by Professor S. C. Mayo of the Department of Sociology of the North Carolina Agricultural Experiment Station<sup>1</sup> and has been extensively used in the recent campaign for additional funds to support the health and hospital program of that state.

Professor Mayo's procedure is—in essence—a modified method of computing age-standardized death rates, with a more rigorous yardstick. His objective is to make comparison for each age period with the lowest death rate for that period recorded in the 1940 Census for white persons in the urban or rural area of any state. The figures actually used are as follows:

Age Period, Years	Area Used	Deaths per 1,000
Under 1	Rural Oregon	28.4
1-4	Urban Wisconsin	1.4
5-14	Rural Arizona	0.5
15-24	Urban Rhode Island	0.8
25-34	Urban Massachusetts	1.3
35-44	Rural Kansas	2.6
45-54	Rural Iowa	5.2
55-64	Rural Arizona	11.5
65-74	Rural Arizona	27.3
75 and over	Rural Arizona	72.8

Professor Mayo, using these figures, computes that, if the minimum rates tabulated above had obtained in North Carolina, that state would have had 16,642 deaths in 1940. It actually had 31,904 deaths.

The procedure used obviously ignores racial and economic and climatic differences on the assumption that these differences may conceivably be overcome (which is certainly true of those relating to economic status). If such limitations are frankly recognized, stimulation of local pride to overcome existing obstacles, as far as possible, ought to prove wholesome. A question also arises as to the validity of rates (such as those for Rural Oregon and Rural Arizona) which are



based on populations of between 3,010 and 55,100 persons. (The lowest actual number of deaths at any age period is at age 55-64 for Rural Arizona.)

The technique, however, seems to offer an intriguing challenge. We would welcome correspondence on it, and particularly suggestions by statisticians as to the minimum populations which might be safely used in such an estimate. It would seem worth while to test a formula of this type by application to various communities and areas.

#### REFERENCE

1. *Progress Report No. R S-6*, North Carolina Agr. Exp. Station, State College Station, Raleigh. Sept., 1945.

# Report of the Archivist, 1946

## *Laboratory Section*

AT the meeting of the Association in 1944 report was made that since all available early archival material appeared to have been deposited, it was planned to examine some of the items in detail for their value as historical records or for reference. It seemed logical to begin with an examination of the collected programs. This is the forty-sixth official meeting of the Section. Since it is almost a quarter of a century since the last meeting in Cleveland (1922), the program for that year was selected. A comparison of the programs of 1922 and 1946 gives a remarkable picture of the advancing place of the laboratory in the practical and academic fields of medicine and public health.

In 1922 the membership of the Association was less than three thousand, while now it is over ten thousand. The membership of the Section in 1922 was approximately 500, having also trebled in the twenty-four years to its present fifteen hundred. The character and scope of the work of the Section have also developed significantly.

Dr. Hitchens was secretary of the Section in 1922 and chairman of the program committee. The Section had two sessions. The program lists nine papers, one committee report, and the address of the chairman, Dr. B. L. Arms, Director of the Bureau of Diagnostic Laboratories of the Florida State Board of Health. At the present meeting, the Laboratory Section is scheduled for more sessions and for the presentation of a greater number of papers than any other section of the Association—eight sessions of the Section alone and one joint session, with a total of fifty-

eight presentations and eight committee reports. Moreover, the Conference of State and Provincial Public Health Laboratory Directors met for two full days before the Association meetings, with three sessions each day. This situation is all the more interesting when the constitutional restriction on the newly formed Laboratory Section in 1900 is recalled. The authorization for the Section, which was organized in 1899, reads:

"Meetings shall be held on the first day of the meeting of the Association and at such other times as may be decided upon, but no meeting shall be held during the time occupied by the meetings of the Association."

The contribution of the laboratory is further shown by an examination of the programs of 1922 and 1946 against a handwritten report in the archives of 1908 from Dr. Herbert U. Williams of the University of Buffalo—"A report on standard methods for laboratory diagnosis of syphilis."

". . . The outlook for the practical employment of laboratory methods in Board of Health work seems not very encouraging for the immediate future. . . . Attention must be paid to staining with aniline dyes, to silver impregnations, and to serum diagnosis. . . "

In 1922, fourteen years later, Dr. Young and Dr. Kahn reported on the use of the serologic test for syphilis in a public health laboratory; and intervening progress since 1922 is suggested by the important series of papers in Cleveland's program dealing with the standardization of laboratory procedures in the field of public health.

The keynote of the address of the

chairman<sup>1</sup> in 1922 was "Service." Dr. Arms said:

"I have selected the motto 'Service' as indicating what I feel the Laboratory Section . . . and the individual worker . . . should stand for.

"The laboratory worker has a real place to fill . . . Public health administrators all over the world are depending more and more on laboratory work to guide them in their endeavors to limit the spread of disease and, what is far more important, to prevent the occurrence of infection.

" . . . It is a fact that the keynote of our profession may be summed up in a single word — 'Service.' "

Certainly this attitude of service was outstanding in the career of Dr. Mazýck P. Ravenel, charter member, whose death has occurred since the last meeting, and whose contributions and achievements have been widely noted. The deaths of Dr. Ravenel and of twenty other members of the Section are here recorded with regret.

You will recall that in 1943 Dr. Wadsworth canvassed members of the Section to secure a record of services and activities in relation to the war at that time. It seems important to complete that project as far as possible by attempting to secure a final record by another questionnaire to the members.

Since the establishment of the office of archivist in 1935, the status and needs of the collection have been reported regularly. By action of the Council, the minutes of the meetings of the Section and of the Council are now deposited. No record of current activities of individuals, groups, or committees has been received, however, since 1941. As has been said in other years, the test of the archival quality of a record is still often taken to be that of age, but any document or correspondence that forms a part of an official transaction and that should be preserved for future reference should be deposited in the archives as soon as it ceases to be of current use. I therefore close with

a renewed appeal for an awareness of the value of each transaction related to the Section.

### Deaths of members reported between meetings of October, 1944, and November, 1946

- Theodore D. Beckwith, Ph.D.  
Los Angeles, Calif.  
Elected member 1934
- George E. Bolling  
Brockton, Mass.  
Elected member 1900  
Charter Fellow and 40 year member.
- Severance Burrage, D.P.H.  
Denver, Colo.  
Elected member 1897  
Charter Fellow
- O. N. Eisaman, M.D.  
Pittsburgh, Pa.  
Elected member 1940
- Harry M. Endowe  
New Haven, Conn.  
Elected member 1938
- John Grill, M.D.  
Milwaukee, Wis.  
Elected member 1935
- Nell P. Hall  
Champaign, Ill.  
Elected member 1931
- Jane I. Hershey, Ph.D.  
St. Louis, Mo.  
Elected member 1941
- Fred H. Jennings  
Watertown, N. Y.  
Elected member 1908
- Israel J. Kligler, Ph.D.  
Jerusalem, Palestine  
Elected member 1912  
Charter Fellow
- Lt. Peter J. Knaus, Sn.C.  
Service overseas  
Elected member 1943
- William Litterer, M.D.  
Nashville, Tenn.  
Elected member 1926  
Elected Fellow 1934
- Joseph McFarland, M.D.  
Elected member 1899
- Ward J. MacNeal, Ph.D., M.D.  
New York, N. Y.  
Elected member 1920
- Walter H. Oglesby  
Clovis, N. M.  
Elected member 1945
- William O. Pauli, M.D.  
Cincinnati, Ohio  
Elected member 1930

Mazýck P. Ravenel, M.D.

Columbia, Mo.

Elected member 1897

Charter Fellow

Randle C. Rosenberger, M.D.

Philadelphia, Pa.

Elected member 1915

Charter Fellow

Charles Urbach, M.D., Ph.D.

Philadelphia, Pa.

Elected member 1941

Mortimer Warren, M.D.

Portland, Me.

Elected member 1942

Fred A. Wiggers

Toledo, Ohio

Elected member 1940

#### REFERENCE

1. Arms, B. L. Service. *A.J.P.H.*, 13:37-39, 1923.

ANNA M. SEXTON

---

## Public Health Interest in Pennsylvania

The Pennsylvania State Medical Society at its meeting in October, 1946, passed a resolution setting up a Commission on Public Health and Preventive Medicine within the society. Its chairman, Pascal Lucchesi, M.D., reported on the plans of this Commission at a recent annual meeting of the Pennsylvania Tuberculosis Society in Harrisburg.

He declared that the appointment of the Commission "marks the first official recognition of organized medicine in this state of the need for more active participation of this great medical body in the field of public health and preventive medicine."

Summarizing the difficulties created

in the state by its complicated public health laws and its more than 2,500 local health jurisdictions, he outlined the following goals of his Commission:

1. Stimulate the interest of the medical profession of the state in public health through the County Medical Societies.
2. Stimulate the establishment of a graduate school of public health and preventive medicine in the state.
3. Bring about the united action of doctors, dentists, nurses, and allied groups for a better program of public health in the state.
4. Bring about a complete public health survey of the state.
5. Prepare a model public health code.
6. Bring about the establishment of decentralized full-time local health units.
7. Study specific local public health problems.

# Coördinating Committee on Standard Methods

## Laboratory Section

*Personnel Changes*—A. Parker Hitchens, M.D., Robert S. Breed, Ph.D., William D. Stovall, M.D., and Friend Lee Mickle, Sc.D., resigned as chairmen of their respective committees functioning under the Coördinating Committee on Standard Methods, and the resignations were accepted. Col. Hitchens, who had been chairman since the committee was originated, was commended on the accomplishments of the committee and was made an honorary member of the committee. A. H. Robertson, Ph.D., was elected Chairman of the Committee on Examination of Dairy Products, and Ralph S. Muckenfuss, M.D., Chairman of the Committee on Diagnostic Procedures and Reagents. The Committee for Frozen Desserts and Ingredients was put in Dr. Robertson's hands, at least until a permanent chairman is elected. Edmund K. Kline, Dr.P.H., as ex-officio secretary of the committee, was replaced by Geoffrey Edsall, M.D., the incoming Section secretary.

*Committee on Examination of Water and Sewage*—Walter L. Mallmann, Ph.D., is active in work preparatory to the publication two or three years hence of a 10th edition of *Standard Methods for the Examination of Water and Sewage*. John F. Norton, Ph.D., chairman of the Editorial Committee for the 9th edition of the water and sewage report, gave assurance that the 9th edition will soon appear, with a 1946 date.

*Committee on Examination of Milk and Dairy Products*—Dr. Breed presented a manuscript for the 9th edition

of *Standard Methods for the Examination of Dairy Products* that was accepted by the Laboratory and the Food and Nutrition Sections, the councils of those Sections, the Coördinating Committee on Standard Methods, and the Association for publication. Dr. Robertson, who had been chiefly responsible for editing this edition, was elected chairman of the committee replacing Dr. Breed. Dr. Breed was continued as chairman of the Editorial Committee for the 9th edition of the dairy products report.

*Committee for Frozen Desserts and Ingredients*—The report of this committee revealed that several new procedures for examining frozen desserts and ingredients will appear in the 9th edition of the milk and dairy products report and procedures for sediment will be deleted as impracticable. The manuscript has been edited by Dr. Robertson and is ready for publication with the report from Dr. Breed's committee.

*Committee on Diagnostic Procedures and Reagents*—Dr. Stovall had submitted his resignation some time previously and the resignation was accepted at this meeting when it had been ascertained that he would no longer continue as chairman. Dr. Muckenfuss has accepted the chairmanship. It will doubtless be necessary for him to form an essentially new committee to begin preparation for the 3rd edition of *Diagnostic Procedures and Reagents*.

*Committee on Virus and Rickettsial Diseases*—Thomas Francis, Jr., M.D., and his committee presented an outstanding panel discussion before the

Laboratory Section at Cleveland. It was realized by those who heard it that the techniques for virus and rickettsial diseases are in much more complete form for publication than most of us had realized. At a very enthusiastic meeting of the committee a deadline of March 1 was set when the manuscripts are to be in the hands of Dr. Francis preparatory to a recommendation from that committee that a volume of laboratory techniques for virus and rickettsial diseases be published by the Association as promptly as possible.

*Committee on Biological Products*—In the absence of Dr. Robinson, the chairman, no meeting of the committee was held and no report submitted.

*Committee for the Examination of Germicides and Antibacterial Agents*—Your chairman does not know whether or not a meeting of this committee was held at Cleveland. Several interesting papers were presented by referees working under Stuart Mudd, M.D., in connection with the activities of this committee and some of them will certainly merit publication. Your chairman does not know whether publication in the *Journal* will take care of the accomplishments of this committee or whether a volume similar to that published by other committees is planned.

*Committee on the Biology of the Laboratory Animal*—In the absence of R. A. Kelser, Ph.D., the chairman, no report of this committee was rendered and no meeting was held.

*Committee on Examination of Shellfish*—James Gibbard reported activity on the part of this committee with considerably revised methods about ready for publication.

*Possible Committee on Stains and Staining Technique*—It is understood that E. K. Kline, Dr.P.H., was elected the Laboratory Section representative on the Commission of Biological Stains. Your chairman was informed that the

work of that commission is expanding and that the commission would be glad to have the activities affecting public health laboratory work taken over pretty much by a committee of the Laboratory Section that might very well function under the Coördinating Committee on Standard Methods. The proposal was made that Dr. Kline might be invited to attend the next meeting of this committee to outline the activities contemplated.

#### SUMMARY

It can be seen even from this brief resume that the CCSM is one of the active, productive committees of the Association. We all realize the rapidly changing character of public health laboratory work in most of its ramifications at the present time. The efforts of the committees functioning under CCSM bid fair to produce far-reaching results. Apparently it is the function of the CCSM to stimulate these activities and coördinate them in every way possible. Your chairman feels most humble regarding his ability to be of service in this capacity. He can help arrange for meetings of this group so that the activities will be coördinated, and he can transmit the accomplishments to the Section and to the Association through the Committee on Research and Standards for action.

At the Cleveland meeting there was some expression of feeling that in its expanding functions the Coördinating Committee may have outgrown the Laboratory Section and that it may need to be raised to an Association level. A subcommittee of the Committee on Research and Standards has been appointed to consider the status of CCSM as a committee. Suggestions from each member to the chairman of the committee is desired toward a solution as to how the best future accomplishments can be secured.

## PROPOSED MEETING

There seems to exist a real need for a meeting of CCSM in the rather near future. Some day during the second week of January in New York City has been proposed. This brief resume of

the committee activities may serve as a sort of springboard to the development of agenda for the meeting. Comment and suggestions are requested.

FRIEND LEE MICKLE, Sc.D.,  
*Chairman*

---

## Proposed Federal Program for Circulatory Diseases

On February 26 Senator Claude Pepper of Florida introduced a Bill (S. 720) which has been referred to the Committee on Labor and Public Welfare, authorizing and requesting the President to undertake to mobilize at some convenient place or places in the United States an adequate number of the world's outstanding experts and to coördinate and utilize their services "in a supreme endeavor to discover new means of treating, curing, and preventing diseases of the heart and arteries."

The Bill briefly authorizes the President to undertake "in whatever manner he may deem most appropriate" to

bring together outstanding experts from any country and to coördinate their services "through the Surgeon General of the U.S.P.H.S., or through an independent group appointed by him." The President is also authorized to build needed clinical laboratory research facilities in order adequately to approach this problem, which, according to the Bill, involves the death of more than 587,000 persons a year in the United States and which causes disability to more than 7 million persons.

The Bill authorizes the sum of \$100,000,000 to be appropriated for these purposes.

# Standard Methods for Dairy Products

## Laboratory Section

THE Committee on Standard Methods for the Examination of Dairy Products wishes to present a 325 page manuscript covering the proposed ninth edition of *Standard Methods for the Examination of Dairy Products* of the American Public Health Association. This report is the work of four groups: (1) Committee on Milk and Milk Products of the Laboratory Section, (2) Committee on Frozen Desserts and Their Ingredients of the Laboratory, and Food and Nutrition Sections, (3) Committee on Assay of Foods of the Food and Nutrition Section, and (4) the Association of Official Agricultural Chemists.

Directions for some of the older technics have been improved and a few new and promising technics have been introduced. Among the new methods are the resazurin test, the methods that have been developed by the Federal Food and Drug Administration for determining the amount and type of extraneous matter in dairy products other than market milk and cream, and methods for the bacteriological examination of stabilizers used in frozen desserts.

Only two changes in commonly used technics will cause enough change in results secured to be worth mentioning:

(a) The temperatures given for the incubation of agar plates in the eighth edition are 32° or 37° C. After consultation with the Directors of State and Provincial Laboratories and others,

the incubation temperatures have now been established at 32° C., or at 35° C. This will increase the accuracy of results especially where the temperature used is 32° C. However, those laboratories that lower the temperatures used for agar plates will secure somewhat higher counts than they have had previously. Administrators should therefore modify enforcement procedures until the industry has been able to adjust itself to the more severe requirements.

(b) The hourly inversion of tubes during incubation of samples for the methylene blue reduction test will cause reduction to take place somewhat more quickly in certain samples of milk, and there will be a greater accuracy in the results secured.

The committee is deeply concerned over the findings reported by Black (*Public Health Reports*, U.S.P.H.S., 58:1605, 1641, and 1681, 1943) which showed that many laboratories do not follow essential requirements outlined in *Standard Methods* for making bacteriological analyses of dairy products. These findings should not be ignored. The records indicate that laboratory work is best done in those areas where state or provincial departments of health supervise the methods used in milk control laboratories in their respective jurisdictions.

Supply houses report that thousands of bacteriological incubators of the type that are heated with high temperature hot plates in the bottom of the chamber have been sold during the past year. From this it may be presumed that little heed is paid to the warning in the *Standard Methods Report* since 1939

---

\* Report of the Joint Editorial Committee for Standard Methods for the Examination of Dairy Products.



that incubators of this type are unsatisfactory for milk work.

Some additions have been made to the Chapter on the Determination of Vitamins by the committee of the Food and Nutrition Section. These consist of methods for the determination of vitamin B, B<sub>2</sub> and niacin.

The most important improvement in the new report has been made by Dr. A. H. Robertson. He has edited the entire text so as to give the reports of the various referees a uniform simple and direct style. A simple cross-reference system has also been introduced. Discussions of the applications and limitations of the various technics have been rewritten by Dr. Luther Black, and have been segregated in a separate chapter at the beginning of the report.

All of this editing and rearrangement will lead to better indexing that will make the report more usable, thereby fully justifying the printing of a new edition.

R. S. BREED, PH.D., *Chairman*  
A. PARKER HITCHENS, M.D.  
F. LEE MICKLE, Sc.D.  
H. T. SCOTT, PH.D.  
A. C. HUNTER, PH.D.\*

---

\* Deceased.

Action was taken at the Cleveland meeting by all of the Section groups and by the Association Committee on Research and Standards recommending to the Governing Council the publication of this manuscript as the Ninth Edition of *Standard Methods for the Examination of Dairy Products*.

# Examination of Frozen Desserts and Ingredients\*

*Laboratory and Food and Nutrition Sections*

IN the last report of this committee it was stated that a manuscript revision of the text of the 8th edition of *Standard Methods for the Examination of Dairy Products* had been prepared by Dr. A. H. Robertson preliminary to the preparation of the 9th edition of that report, the purpose being to have a revision of the entire text prepared by one individual with the elimination of inconsistencies in directions written by different referees. At the time that the last report was written the activities of the referees in the preparation of methods had been nearly completed and all that remained for the Committee to do in preparation for the 9th edition of *Standard Methods for the Examination of Dairy Products* was to work with the Standard Methods Committee on Milk and Milk Products of the Laboratory Section and with Dr. Robertson as editor of the 9th edition to complete the revision of the text to conform with the text for the other portions of the publication.

Two meetings of the Standard Methods Joint Committee on Frozen Desserts and Ingredients have been held since the last report was submitted. Both were held jointly with the Committee on Milk and Milk Products of the Laboratory Section. The meetings were well attended and real progress was made toward publication of the

forthcoming edition of the dairy products report.

In the preparation of the 9th edition much effort has been expended in getting the technical procedures into an imperative form which it will be easy for laboratory workers to follow. In doing this it was found desirable to sort out the material dealing with the interpretation of results and the discussion of the uses and limitations of methods and remove it to a separate chapter where it has been combined with similar material regarding milk and other milk products. It is believed that in this form the new new edition of *Standard Methods* will be much more serviceable not only to laboratory workers but also to control officials.

The accomplishments of the committee in preparation for the 9th edition of the dairy products report can be summarized as follows:

1. Methods for the microbiological examination of stabilizers have been included among the technical procedures.
2. Directions for determining the weight per unit volume of ice cream have been incorporated as determined by the Gibbard and by the Hart Method.
3. The sediment test methods for frozen desserts and for frozen dessert ingredients that appeared in the 8th edition have been deleted as they were deemed impracticable.
4. A suggestion has been made in the 9th edition that one or more modifications of the methods for extraneous matter in dairy

\* Report of the Joint Standard Methods Committee.

STANDARD METHODS COMMITTEE ON FROZEN DESSERTS AND INGREDIENTS

Organized 1937. Published reports: *Year Books* 1937-1938, 1939-1940, 1940-1941, 1941-1942, *A.J.P.H.*, May, 1943, Aug., 1945.

products may be adapted to the detection and determination of filth and foreign matter in both frozen desserts and frozen dessert ingredients

5. Applications, with precautions, of the phosphatase test are suggested for use on finished frozen desserts

There has been considerable discussion among the members of the committee of proposals relative to (a) weighing out the first portion of frozen desserts while the material is still frozen, and (b) reconsideration of the procedures for coliform determinations in frozen dessert products. These rather controversial matters probably will require further study before directions can be prepared that will be acceptable to all who are interested in these procedures.

Dr. K. G. Weckel, University of Wis-

consin, Madison, Wis., was appointed referee for sediment test methods in frozen desserts to fill the vacancy mentioned in the last committee report.

It is suggested that the Laboratory Committee of the Joint Committee on Frozen Desserts and Ingredients might well be discontinued with the publication of the 9th edition of *Standard Methods for the Examination of Dairy Products* as the present activities of the committee will be completed when that work is published. Any studies on frozen desserts to be undertaken in preparation for a 10th edition of *Standard Methods* might well be taken under consideration by the Committee on Milk and Milk Products.

FRIEND LEE MICKLE, Sc.D., *Chairman*

Joint Committee

State Department of Health

Hartford, Conn.

*Representatives from the Laboratory  
Section*

FRIEND LEE MICKLE, Sc.D.,

*Chairman*

JAMES A. GIBBARD

A. H. ROBERTSON, Ph.D.

*Representatives from the Food and  
Nutrition Section*

F. W. FABIAN, Ph.D., *Chairman*

J. H. SHRADER, Ph.D.

K. G. WICKFL, Ph.D.

*Associate Referees*

M. T. BARTRAM, Ph.D.

PAUL A. DOWNS, Ph.D.

H. H. HALL

F. LESLIE HART

P. S. LUCAS

W. H. MARTIN

PAUL S. PRICKETT, Ph.D.

M. J. PRUCHA, Ph.D.

P. H. TRACY, Ph.D.

# Examination of Water and Sewage\*

## Laboratory Section

YOUR committee is glad to report that the ninth edition of *Standard Methods for the Examination of Water and Sewage* is now in press. The ninth edition has been delayed in preparation largely because of many obstacles caused by the war.

The work of your committee has been completed with the publication of the ninth edition. It is suggested that a new committee be appointed immediately to plan for the tenth edition, as there are already many suggestions which have been received on improvements of methods which will appear in the ninth edition.

Dr. George E. Symons, who has been employed to edit the ninth edition by the Joint Editorial Committee makes the following recommendations in regard to future editions:

A Joint Editorial Board for the tenth edition should be formed and begin work as soon as the ninth edition is off the press.

The tenth edition should be published not later than early 1950, as many of the methods in the ninth edition are already subject to criticism. Publication in 1950 means that revision of the text must be accomplished by the spring of 1949 in order to allow one year for final editing and printing.

Each association interested in *Standard Methods* should have a committee devoting its energies to that subject with the membership being chosen with full consideration of geographical location, laboratory facilities, and laboratory interest of the members.

These committees may find it helpful to adopt the system used by the *Standard Method*

Committee of the Federation of Sewage Works Associations, namely that all of the material falling within their provinces of interest be circulated throughout the entire committee membership for comment, correction, addition, editing, etc.

Chemical methods, etc., should be reviewed by members of the American Chemical Society as well as by committee members of the *Standard Methods Committees* of the A.P.H.A. and A.W.W.A. Methods dealing with microscopic analysis and bacteriological analysis should be referred to the pertinent cooperating committees, and sewage tests should be referred to the Federation of Sewage Works Associations Committee.

It has been suggested that the Joint Editorial Board, when appointed, should review on the broadest possible basis, the functions for which it was established and report to the governing bodies of constituent associations its decision as to the proper activities it will undertake.

Heretofore the Editorial Board has concerned itself only with appraising published methods. It has been suggested that the Joint Editorial Board extend its activities to the field of developing new and better methods of analysis.

Objections have been raised to this suggestion for broadening the scope of the Joint Editorial Board. A compromise between these two viewpoints appears desirable. Perhaps the Joint Editorial Board should broaden its scope to the extent that it assemble opinions as to the weaknesses of individual

\* Report of the Standard Methods Committee.

STANDARD METHODS COMMITTEE ON EXAMINATION OF WATER AND SEWAGE

Organized 1899. Reorganized 1933. Published reports: *Year Books* 1930-1931, 1934-1935, 1935-1936, 1937-1938, 1939-1940, 1941-1942, A.J.P.H., May, 1943, Aug, 1944, Sept., 1945. 9 volumes published: 1905, 1912, 1917, 1920, 1923, 1925, 1933, 1936, 1946.

# Clearing House on Public Health Salary Information

WITH the introduction of this informal and temporary department of the *Journal* in the May issue (page 576), the Editors promised to collect information about salaries of public health workers from the sources available to them, and invited readers to participate in the discussion.

We present herewith the month's gleanings. The items are in no special

order other than that given them by the make-up man. If they prove anything it is that a ferment is at work and various groups in public health are beginning to raise their voices in their own behalf for recognition of the monetary value of their services.

Next month we hope to publish a recommended salary scale for health officers approved by the Executive Board.

## THE CANADIAN SALARY STUDY

The Canadian Public Health Association has recently published the findings of its Committee on Salaries and Qualifications of Public Health Personnel.<sup>1</sup> This committee declares at the outset, "If it is agreed that 'public health is only as successful as the people in it,' then the logical answer to procurement of 'successful people' is first to train them properly and then to make the public health positions in official agencies attractive enough to hold them. It should be obvious that it is economically unsound to spend money training personnel for public health and then lose them, for financial reasons, to other agencies or to private endeavor."

Acting on this faith, the Canadian committee makes salary recommendations in several grades for each of the professional groups working in public health in the dominion—physicians, nurses, engineers, laboratory and statistical personnel, nutritionists, veterinarians, and sanitary inspectors. The

recommendations indicate an awareness of the fact that the prevailing salary levels must be raised if "public health positions in official agencies" are to be made "attractive enough" to hold trained workers.

Because of the differences in cost of living, the actual recommended rates for personnel in Canadian official agencies have limited usefulness for the United States. What is important, however, is the bold, sure recognition that the most important single action needed currently to secure and retain adequately qualified personnel is to raise salaries. Within a year after the Canadian Public Health Association was requested by the Dominion Council of Health to make a salary study and recommendations, the report was completed and published for distribution. Whatever may be its limitations, it at least has done the first most important job; it has started the thinking and planning for better public health salaries.

<sup>1</sup> Report of the Committee on Salaries and Qualifications of Public Health Personnel. Canadian Public Health Association. *Canad Pub Health J.*, 38:1, 1-37 (Jan.), 1947.

## ENGINEERING SECTION COUNCIL ON SALARIES

At its meeting on February 10, 1947, the A.P.H.A. Engineering Section Coun-

TABLE 1

Federal Civil Service		Engineering Society	
Grade	Salary Rates	Grade	Salary Rates
P-1	\$2,645-\$3,400	I	\$2,700-\$3,400
P-2	3,400- 4,150	II	3,400- 4,200
P-3	4,150- 4,902	III	4,200- 5,100
P-4	4,902- 5,905	IV	5,100- 6,100
P-5	5,905- 7,102	V	6,100- 7,250
P-6	7,102- 8,180	VI	7,250- 8,600
P-7	8,180- 9,975	VII	8,600-10,350
P-8	9,975-10,000	VIII	10,350-12,600
P-9	10,000 and up	IX	12,600 and up

cil adopted the following statement of principle:

In view of the existing demand for engineers, it appears impossible to recruit and retain qualified public health engineers unless salary scales are comparable to those obtainable in other fields of professional engineering, as exemplified by the salary schedule prescribed by the American Society of Civil Engineers and those in effect under the Federal Civil Service, as shown in the attached table.

The salary schedules referred to in this statement of principle each provide for nine grades of duties and responsibilities and thus of salaries. The first grades are listed at \$2,645-\$3,400 and \$2,700-\$3,400 respectively for Federal Civil Service salaries and for salaries recommended by the American Society of Civil Engineers. Grade 9 figures are \$10,000 and up and \$12,600 and up respectively. In the intervals between, the Engineering Society's recommended starting salaries are progressively higher in each grade than those paid currently by the federal services.

The scales for the Federal Civil Service and the recommended salaries of the Engineering Society are shown in Table 1.

RECOMMENDED SALARIES—PUBLIC HEALTH NURSES

A newly graduated public health nurse without experience or special advanced preparation receives between \$2,200 and \$3,300 in voluntary health agencies, and in state or local official

agencies; the same nurse in the employ of the federal government receives between \$2,644 and \$3,397, one-fifth more at the lower level and 3 per cent more at the upper level. This is the information shown in the most recent salary data published by the Nursing Information Bureau<sup>1</sup> in March, 1947.

For "positions attained on the basis of successful experience in nursing and/or supplemented by advanced or special preparation," the lowest salaries reported are the same as for the newly graduated nurse. The maximum salary in state or local official and voluntary agencies is \$9,500; in the federal service it is \$8,059, or about one-sixth less. These ranges apply to a wide variety of positions—from staff nurse rendering general service to director or educational director, consultant, or professor of public health nursing.

More recently the National Organization for Public Health Nursing has published its recommendations for current public health nursing positions.<sup>2</sup> Two salary levels are suggested for staff nurses; from \$2,400 to \$2,640 for the graduate registered nurse who has not yet completed an approved program of study in public health nursing, and might thus be thought of as an apprentice in public health, and \$2,520-\$3,300

1. Of the American Nurses Association, cooperating with the National League of Nursing Education and the National Organization for Public Health Nursing.  
2. *Pub. Health Nurs.*, 32, 5:237-239 (May), 1947.

for the graduate registered nurse who has completed an approved program of study in public health nursing. The latter beginning salary is 5 per cent below that for federally employed public health nurses who begin at \$2,644 and must also have completed an approved program of study in public health nursing.

The National Organization for Public Health Nursing does not make salary recommendations for positions such as administrators, supervisors, consultants, instructors and others, saying only that "they would of course be proportionately higher depending upon the extent of responsibility and qualifications required."

#### SUGGESTED SALARIES FOR PUBLIC HEALTH LABORATORY PERSONNEL

At a recent joint meeting of the Association's Laboratory Section Council and the Laboratory Section Coordinating Committee an agreement was reached as to basic minimum recommended salaries for professional laboratory personnel. The salaries recommended are based upon the qualifications as outlined in the Report on Educational and Experience Qualifications of Public Health Laboratory Workers as recommended by the A.P.H.A. Committee on Professional Education and approved by the Governing Council in 1943.<sup>1</sup>

They are as follows:

Laboratory director .....	\$7,500 and up
Assistant director .....	6,000-\$7,000
Principal bacteriologist .....	4,000- 5,000
Associate bacteriologist .....	3,600- 4,500
Senior assistant bacteriologist..	2,800- 3,500
Junior assistant bacteriologist..	2,400- 3,000

#### FOOD FOR THOUGHT

*Minnesota's Health* for March (Vol. 1, No. 3) in "Where Are They Now?" reports that, of 242 persons trained by

the Minnesota Health Department since 1932, only 91 are still doing health work in Minnesota. It uses pictographs to show how extensively the various professional groups have strayed from their own training area. Engineers have the best record, 20 of 38 trained still in public health activities in the state. Unfortunately the retired, died, or status unknown groups are all classified together and make up one-third of the nurses. Of the remaining nurses trained, more than half are still in service in the state. The Minnesota bulletin does not philosophize about the reasons for the loss of nearly half of the still active workers whom it trained. However, since more than one-fourth of those known to be working are in public health work outside of the state and one-fifth have gone into private practice or industrial service, the connection between this turnover and salaries seems obvious.

#### SALARY STUDY UNDER WAY BY STATE AND PROVINCIAL PUBLIC HEALTH LABORATORY DIRECTORS

The Conference of State and Provincial Public Health Laboratory Directors has an active Committee on Qualifications and Salaries of Laboratory Personnel. Its Chairman is Miss Myrtle Greenfield, Director of the New Mexico State Health Department Laboratory, Albuquerque. This committee is studying current salaries and vacancies in state health department laboratory divisions with a view to arriving at salary recommendations. It has sent out questionnaires to all state health departments. As soon as these have been returned they will be analyzed and used as the basis for salary recommendations for laboratory personnel in official agencies throughout the country.

#### WHAT THE READERS SAY

Dr. Henry F. Vaughan, Dean of the School of Public Health, University of

1. *A.J.P.H.*, 33, 7:882-887 (July), 1943.

Michigan, Ann Arbor, Mich., writes:

"I have a very strong conviction that salaries constitute the greatest single barrier to securing an ample supply of well trained and experienced career people in public health administration. If I were to list the ten most important causes for our inability to personnel our health departments, I would put salary in first, second, and third place.

"We must impress upon the public mind the fact that the director of a public health department is a trained health specialist whose salary should be commensurate with the income of other specialists in the medical field. The highest compensation in county or city government should go to the director of public health and the superintendent of education who have devoted years to their professional training and who because of their responsibilities and professional background are not to be compared with elective public office holders who usually have a business, trade or pro-

fession other than that of government.

"A real contribution can be made by the public in focusing attention upon the essentialness of making public health practice a professional service with adequate compensation and encouragement to those who prepare for and serve in this field. Business men, industrialists, and lay organizations can see to it that suitable remuneration for the public health officer is forthcoming, even though in some instances it is necessary to augment the public appropriation with temporary financial support from lay sources. This latter is suggested as a temporary expedient during the days of extreme shortage of personnel and a stop-gap until there can be a more general recognition of the need for adequate compensation. After all, the whole question resolves itself into one of competition. There are too many public health men resigning their positions to accept the more lucrative opportunities of private practice."



## Credit Lines

### CONTROLLING HAY FEVER IN NEW YORK

Recently completed at New York University (New York City) was a course of instruction in Methods of Control of Plants Detrimental to Public Health. Planned by an advisory committee of representatives of the health departments of New York City and Westchester County, New York, and the two metropolitan counties in New Jersey, Bergen and Hudson, it was designed to instruct health officers and others in carrying out a program of weed control in the metropolitan area during the summer of 1947.

The course was attended by more than 100 persons. In addition to the nearby communities represented there were students from Albany, Philadelphia, Connecticut, New Hampshire, and Cincinnati. The series of six lectures was priced at \$5, with registrations accepted only for the entire series.

Partly as a result of this series, the Brooklyn Botanic Garden (N. Y.) in April sponsored a meeting of the metropolitan area garden clubs and health departments to consider the problem of weeds detrimental to public health. Included in the 1947 programs of the garden clubs will be the detection and elimination of ragweed and other weeds injurious to health.

### FACTS ABOUT THE WORLD HEALTH ORGANIZATION

If you have missed any of the significant details about the World Health Organization in newspapers or other journals, a recent publication of the Interim Commission will fill in the gaps. A *Fact Book* of 15 mimeographed pages summarizes the background and origin of the WHO, what its current functions are, with particular reference

to those taken over from UNRRA, the League of Nations, and the Office International d'Hygiene Publique. A list of publications, a bibliography, and general information as to headquarters and officers are included.

The Interim Commission's Headquarters office is at 6306 Empire State Building, New York. Brock Chisholm, M.D., is Executive Secretary, and Frank A. Calderone, M.D., is Director of the headquarters office. The Deputy Executive Secretary of the Interim Commission, Dr. Yves Bifaud, is in charge of the technical office in the League of Nation Building, Geneva.

The *Fact Book* is available from the Headquarters Office, World Health Organization, 350 Fifth Ave., New York 1.

### TRIBUTE TO CLIFFORD CAUDY YOUNG

Many readers of the *Journal* will remember "Cy" Young, handsome, debonair, courageous in the face of an incurable cancer through which he lived ten years instead of the two that he was given by his doctors. Now Paul de Kruif has brought him to life for us again in "Anonymous Doctor to Five Million" in the April *Reader's Digest* (Pleasantville, N. Y.) In swift and moving style is told how he built the Michigan State Laboratories. His drastic reduction of the state's diphtheria death rate, his work in discovering the cause of Michigan's widespread goiter and the means of preventing it, putting the laboratories at the disposal of private physicians, the development of the Kahn test, the growth of Dr. Kendrick's pertussis vaccine experiments, the building of a virus laboratory, the provision of free pneumonia serum and free blood plasma—all these are re-

ported with the background of ingenuity, righteous indignation, and utter selflessness with which Young got funds from reluctant legislators. For example, when legislators objected to the cost of free blood plasma, he growled, "You can bury a baby for \$125. It might cost all of \$500 to save that kid with commercial plasma. If you want to bring money into this argument, its cheaper to let the babies die!"

C. C. Young died on June 5, 1944, before he had time to carry out his program, already mapped out, for providing free penicillin to all who needed it and could not otherwise afford it. In a real sense he lives in the C. C. Young Public Health Laboratory at Lansing in the 22 buildings of which his work and his spirit are radiating to all of Michigan and indeed to much of the world.

#### HEALTH OF FARM WORKERS

The January *Health Bulletin* of the North Carolina State Board of Health reports a project that could well be repeated in other areas. Late in 1947, the manager of the 22,000 acre Braswell Farms, located in Nash and Edgecombe Counties, arranged for a mass health survey of the farm employees. By arrangement with the health officers of the two counties the 900 persons in the 140 families employed by the farm were brought to the county health center where they received complete physical examinations, including chest x-rays provided through the State Department of Health's Mobile X-ray Unit. Blood samples were sent to the State Laboratory for analysis. The examination included dental inspection and a check up on vaccinations of children under six. It will be interesting to watch this project and the degree to which it succeeds in its aim of remedying as far as possible any defects.

One immediate by-product of the project, chest x-rays were offered to all inhabitants of the two counties.

#### INDUSTRIAL MASS X-RAYS

*X-ray the Picture of Health* is produced by the Health Education Division and published by the Tuberculosis Control Division of the New Jersey State Department of Health. It is a brief outline of the program of free chest x-rays for industrial employees. As background it gives briefly the tuberculosis mortality rates and the age incidence.

The illustrations are made up of letters or newspaper clippings about those plants in which workers have already been x-rayed. The list of nearly 100 plants is also included. Ring bound in a stiff red, white, and blue cover, it is an effective piece of specialized health education.

#### ART SERVES PLASTIC SURGERY

Artist Virginia A. McCall was recently announced as the winner of the 1946 Gimbel Philadelphia award of \$1,000 given annually to a woman who has done outstanding work for humanity. She was cited specifically for assisting surgeons in plastic operations by making drawings of the patients for use by the doctors. She has also worked with bed patients in Veterans' hospitals, teaching them to make wood cuts, drawings, and water colors.

#### LEARNING ABOUT HEALTH IN SCHOOLS

We have decided that there is literally no end to the variety of ways in which communities can be made public health conscious. Credit Lines has recently been sent three issues of *World Week*. In case you are a stranger to it, as we previously had been, this is a national weekly magazine and is intended for the use of teachers of social science studies in high schools.

The three articles that interested us are "Keep Yourtown Healthy" (Feb. 3), "Yourtown's Hospital" (Feb. 10), and "Take It Away!" (Feb. 24). The first is about the local health department, the six standard functions that it

should carry on and the necessity for organizing in units large enough to do effective work. The second outlines briefly the need for hospital service and how each community can organize to meet these needs. The third deals with garbage and sewage disposal.

Each of these is written in a breezy style that relates the problems to the child's own home town. Photographs and anecdotes are used for illustration. Further, it has both a teachers' and a student edition.

If you have not seen this magazine you will perhaps want to send for a sample copy. Address, *World Week*, 220 East 42nd Street, New York 17. Group rates 50¢ a semester or \$1.00 a year; teachers' edition \$1.50 a year.

#### NASHVILLE'S NEW HEALTH BULLETIN

With February, 1947, The Health Advisory Committee of the Nashville, Tenn., School Health Service issued Volume I, No. 1, of *Health Bulletin* intended for teachers. It is full of ideas for health education. In the first issue are discussions of tuberculosis with special reference to "X-ray Program for City Schools," "Better Breakfast Week," "Physical Examinations." List of films and film strip and a "Did You Know That" department. Mimeographed, and with very simple, almost crude line drawings, it is nevertheless extremely effective.

#### WIDE USE OF CANADIAN V.D. FILMS

*Canada's Health and Welfare* (Feb. 1947) justifiably points with pride to the international recognition given its V.D. films. Very Dangerous, for male audiences, has been purchased by the Michigan and Hawaii boards of health and four commercial film libraries in the United States.

Sixteen to Twenty-Six, designed for women and girls, has been ordered by the U. S. War Department in sufficient quantity for all Women's Army Corps

training centers, all army area overseas libraries, and for the Signal Corps' library in Nanking. It is also being used in 13 "government girl" residences by the employees health service division of the U. S. Public Health Service. Over a dozen prints have been sold to the U. S. offices of the National Film Board.

Both films aroused considerable interest when they were shown at the annual meeting of the American Public Health Association in Cleveland last November. They are 16 mm. color films with commentary by the late Dr. J. J. Hagerly, former federal director of the Canadian Health Service. Available from the National Film Society of Canada, 172 Wellington Street, Ottawa.

#### IS DIABETES COMING UNDER CONTROL?

The Prudential Insurance Company of America (Newark, N. J.) has announced that under certain conditions, it will now insure men and women who are under treatment for diabetes. The announcement credits this move to the advances made in the treatment of diabetes in the past 25 years. It is careful to say that not all sufferers from this disease will be accepted but only those whose medical history is favorable.

#### N F I P IN 1946

The eighth *Annual Report*, (year ending May 31, 1946) of the National Foundation for Infantile Paralysis follows upon the most severe epidemic of polio since 1916. It tells how the serious epidemics were handled first in Utah, then Illinois. Other states with serious outbreaks were New Jersey, Tennessee, Texas, Wisconsin, Montana, Iowa, and Washington. The emergency care, together with the long-time programs, have been a heavy drain upon the funds of the Foundation.

Among the new developments described are the PEV's, Polio Emergency Volunteers, which are units of specially

trained women in bedside care of polio patients. They do non-paying non-professional tasks, thus leaving hospital staffs freer for the skilled tasks. During the year there were 2,000 such volunteers in 75 communities of 31 states. The Foundation now has 54 state offices and local chapters in 2,712 of the 3,070 counties.

Another development was the epidemic aid unit, made up of an orthopedic surgeon, orthopedic nurse, and two physical therapists. Each unit is "on call" by epidemic areas, to organize and supervise treatment until the community can recruit personnel to meet its needs. Such units have been established in coöperation with Harvard, Northwestern, and Stanford Universities, and the Watson School of Physical Therapy in Pennsylvania.

The report gives a complete report of the grants and appropriations authorized by the Foundation during the year, indicating in each case both purpose and agencies to which grant was made. In summary they are:

For virus research.....	\$1,259,153
For research for the prevention and treatment of after-effects.....	599,674
For medical care.....	2,612,303
For education.....	3,102,585
Total.....	\$7,573,715

Total disbursements against these grants and those authorized in prior years were \$4,632,289.

#### HEBREW MEDICAL JOURNAL

*Harofe Hivri* (The Hebrew Medical Journal) 983 Park Ave., New York 28, which is dedicated to the continued growth of Hebrew medical literature, has concluded its 19th year of publication. Published semiannually, this journal is bilingual, one-half of each volume being printed in English, the other half in Hebrew. The journal has thus been of particular service to the medical department of the Hebrew University in Jerusalem.

Among the articles published in the English language in the 1946 volumes, public health workers would be interested in a report on "The National Workers' Sick Fund" and a description of "Hygiene and Sanitation among the Bedouins in Palestine." There are also two historical articles, one on the 10th Century Sabbathai Donnolo and the other on the ethics of Jewish physicians in ancient Hebrew Literature.

#### MINNESOTA ACTIVITY

We recently welcomed *Minnesota's Health* to the writing fraternity (March, p. 317). Now comes *Minneapolis Health News* also having started in January, 1947, with Vol. 1 No. 1. No doubt of it, the current air of Minnesota is energizing.

*Minneapolis Health News* is an attractive mimeographed four pages. Its first issue gives a brief history of early public health departments in states and cities. It also discusses the health bills currently under consideration by the Minnesota legislature, chiefly the Health Service Enabling Act. This would authorize county or multi-county health departments. It points out that the proposed act is the result of more than a year's work by a citizens' committee, the Minnesota Committee on Local Health Services.

#### TWO YEARS OF THE EYE BANK

About two years ago the Eye Bank for Sight Restoration in New York City was established. It has a threefold purpose: to take care of the supply and distribution of eyes the healthy corneal tissue of which is to be used in restoring sight to those blind or with defective sight because of injury or disease to the cornea, to train young surgeons in the technique of this transplantation operation, and to encourage research studies in the sources, preservation, and handling of the materials by laboratories or research workers.

With the coöperation of the American Red Cross and Eastern Air Lines, eyes are now often flown to the physicians who need them. This obviates the necessity of long and expensive travel for the patient whose sight is to be restored. The mere mechanism of listing needs, determining priorities, and getting doctor and patient notified as soon as an eyes becomes available is an invaluable service without which many of the operations to restore sight could not be performed.

The Eye Bank maintains a Laboratory for Ophthalmic Research whose director is Herbert M. Katzin, M.D. It has 50 affiliated hospitals in New York State and 27 in 8 other states. In mid-1946 a regional branch was established in Chicago to serve the Midwestern area through affiliated groups of hospitals and ophthalmological societies.

Details of the Eye Bank and its work can be secured from its Executive Director, Mrs. Henry Breckinridge, The Eye-Bank for Sight Restoration, Inc., 210 East 64th Street, New York 21.

#### UNITED MEDICAL SERVICE GROWS

The February *Bulletin* of United Medical Service (370 Lexington Ave., New York 17) indicates how its services have been snowballing in the two and one-half years of its existence. More than twice as many persons were covered at the end of 1946 as at the beginning of the year. Average number of

new enrollments per month was over 20,000, but in January, 1947, they were nearly 51,000. Figures of number and amount of bills paid tell the same story; 1946 monthly average number of bills paid was over 600, in January, 1947, over 1,500; in 1946 the average monthly amount paid was over \$36,000, in January, 1947, nearly \$86,000 was paid.

United Medical Service is a doctor's plan of voluntary medical insurance sponsored by the Medical Society of the State of New York.

#### WORTH ACQUIRING

*Nutritional Charts*—The 12th edition of *Nutritional Charts for Medical and Other Specialists* was recently announced by the Research Department of H. J. Heinz Company. It also announces *Nutritional Observatory*, published three times a year to keep users of charts informed with current developments in more detail than is shown in the charts. Apply to Nutritional Observatory, Department 2C, H. J. Heinz Co., Pittsburgh 12.

*Youth Serves the Community*—This is a plan for student volunteer service in Community agencies giving information on how to organize such a plan, with emphasis upon creative experience and training in citizenship for the young. Available from Community Chests and Councils, 155 East 47th Street, New York 17, N. Y.

## BOOKS AND REPORTS

*All reviews are prepared on invitation. Unsolicited reviews cannot be accepted. All books reviewed in these columns may be purchased through the Book Service.*

**Bovine Mastitis—A Symposium—**  
*Edited by Ralph B. Little, V.M.D., and Wayne N. Plastridge, Ph.D., New York: McGraw-Hill, 1946. 546 pp. Price, \$7.00.*

This is a comprehensive, up-to-date review of our knowledge of this disease written by a group of specialists. These include Mack A. Emerson, Charles W. Turner, Lloyd B. Sholl, Leland J. Tompkins, Wayne N. Plastridge, Claude S. Bryan, Ralph B. Little, J. Howard Brown, Arthur W. Stableforth, Oscar W. Schalm, and Elmer O. Anderson. Discussions cover the anatomy of the udder and the physiology of milk secretion, as well as the diagnosis, bacteriology, pathology, serology, etiology, control, treatment, and, public health significance of this commonest of all cattle disorders that affect the quality of our milk supply.

Because of a literature that is too voluminous for anyone to study, even a specialist in this field, this book is timely and contains just the information that the public health worker needs. The problem of the control of this disease is not solved, but the problem is presented clearly and this presentation should in itself tend to direct observation and research into useful fields. Naturally streptococcal forms of mastitis are given the greatest amount of attention; but there is continuous recognition of other types of bacterial infections that cause other forms of mastitis, with the inclusion of a great amount of information that is not generally available.

The authors state on pages 179–181 that there is no conclusive evidence that a virus may be one of the predisposing causes of mastitis. However, in an

addendum to the book, Baker and Little of the Rockefeller Institute at Princeton report that they have at last recovered a virus-like agent from guinea pigs inoculated with bloody milk from lactating cows. They point out that the significance of this finding is not yet clear. All told, this is a stimulating and worth while book.

ROBERT S. BREED

**Biochemistry of Cancer—By Jesse P. Greenstein. New York: Academic Press, 1947. 389 pp. Price, \$7.80.**

Increased interest in all phases of experimental cancer has created a great need for up-to-date and critical technical treatises on that subject. This need, in so far as biochemistry is concerned, has been admirably filled by the timely appearance of this new publication. The book is prefaced by a chapter on the general phenomena and taxonomy of cancer. The first part deals with extrinsic and intrinsic factors involved in the induction of tumors; the second part deals with nutrition, endocrinology, and chemotherapy in attempts at control of tumor induction and tumor growth; the third part covers the chemistry of tumors, the chemistry of the tumor-bearing host, and the present status of the problem in relation to the properties of tumors. A comprehensive list of references for the work cited appears at the end of each chapter.

The author appears to have made no attempt at all-inclusiveness, but has carefully selected those topics for discussion which have met well established criteria for acceptance as scientific publications. The outstanding features of the book are the remarkable clarity of

presentation, the critical evaluation of the topics discussed, the excellent choice of subject matter and the inclusion of up-to-the-minute information on new research findings.

The book is highly technical and will find great use as a reference book and as a textbook for investigators in cancer research and students of medicine and related sciences.

LEONARD A. SCHEELE

*Baby—A Mother's Manual—By Stella B. Applebaum. Chicago: Ziff-Davis Publishing Co., 1946. 118 pp. Price, \$2.50.*

This is an attractive book, profusely illustrated and simply written. It attempts to cover the range of baby care from the prenatal period through the preschool age, adding a chapter on prevention and care of illness in the home. All this is attempted in 118 pages, with half of the book devoted to pictures rather than text. Because of the brevity of the book, the material is extremely telescoped, barely scratching the surface of some subjects. For instance, prenatal diet in its entirety is covered in one-half page.

In spite of this, the book seems to have certain values. The information is accurate as far as it goes and leads readers to want to learn more. There is a complete bibliography supplemented by direct references throughout the text, giving additional sources of information. Community agencies and their purposes are mentioned with their uses so that one would know where to turn for further help.

The attitude of the author toward the emotional tone in the family is particularly good. In an optimistic and taken for granted manner she explains how the parents' reactions to each other and the baby are important in keeping the baby secure and healthy.

There are many more detailed books available. However, this one would be

a good beginning for an intelligent couple who are willing to read further, because it is generally attractive and stresses good emotional attitudes.

IDA McROBERTS

*Chemotherapeutic and Other Studies of Typhus—By M. Van den Ende, C. H. Stuart-Harris, F. Fulton, and J. S. F. Niven with C. H. Andrewes, A. M. Begg, W. J. Elford, M. H. Gleeson White, W. L. Hawley, K. C. Mills, F. Hamilton, and C. C. Thomas. Medical Research Council, Special Report Series 255, London, His Majesty's Stationery Office, 1946. 246 pp. Price, \$3.65.*

This is a report of the results of studies of typhus fever made by members of the Medical Research Council staff at the National Institute for Medical Research, London, and by the British Army Typhus Research team during the recent war. Interest was concentrated in fields which were believed not under intensive study by the U. S. A. Typhus Commission and Canadian workers. The principal objective of the British investigations was the discovery of an effective chemotherapeutic agent.

In the preliminary screening, some 238 drugs, which are listed, were tested for activity against experimental typhus infection in mice. Two of the compounds, sulfonamides designated V147 and V186, which are *para*-sulphonamidobenzamidine hydrochloride and *para*-sulphonamidobenzamidoxime hydrochloride, respectively, were selected for special investigation, as they were found to have some effect upon the development of the disease in mice, although not when their administration was begun later than 42 hours after infection. Section I of this report describes the studies of the toxicity of these drugs for mice, guinea pigs, and human beings. The observations afforded only a very rough approximation to the maximum tolerated

dose, but serve as a guide to therapeutic trials. The second and principal section of this monograph deals with the clinical use of these drugs in the treatment of typhus infections in human beings. As is usual under war conditions, a great deal of difficulty was encountered in setting up satisfactory test and control groups of patients. Preliminary studies were carried out in North Africa. The 1943-1944 Naples epidemic, which is briefly described, afforded an admirable opportunity for more satisfactory chemotherapeutic trials. The final analysis was based on a series of 60 patients, of whom, 30 received either V186 or V147. Throughout the work no data as to the retention, blood-level or excretion of the drugs could be obtained, as no method of chemical estimation was available. On the basis of clinical severity, duration, and mortality, there appeared to be no significant difference between the treated group and the control group. The observation failed to establish the value of either drug in the treatment of epidemic typhus. In the course of these studies it became necessary to consider very carefully the diagnosis, prognosis, clinical manifestations, and pathology of typhus fever. These have been reviewed in some detail. Comparison with the clinical features of typhus as given by Murchison, 1884, indicates how little the disease has changed in the last 50 years.

Sections III, IV, and V contain accounts of laboratory investigations of typhus carried out at Hampstead. In Section III, a quantitative test for the neutralizing antibodies against rickettsiae is described. The method of assay depends upon intranasal inoculation of mice. Section IV presents a comparison of typhus vaccines by active immunization of experimental animals. It was concluded that vaccine potency depends upon the number of rickettsiae present, and is independent of the "soluble antigen." The authors also ex-

press the opinion that the power of the vaccine to protect mice against the "toxicity" of rickettsiae injected intravenously affords the most convenient and reliable test of vaccine potency. The fifth section is devoted to a comparison of the antigenic structure of a murine (Wilmington) strain of typhus rickettsiae with that of a strain (Cairo, Egypt, 1942) (judged to be identical with the Breinl strain) of epidemic typhus rickettsiae. It is concluded that the surface antigen of the murine strain is similar to, but not identical with, the surface antigen of the epidemic strain.

This monograph is one of the important documents dealing with medical research during the recent World War. It is a reference work which all investigators of the rickettsial diseases will desire to have in their libraries.

KENNETH F. MAXCY

*The Human Body — By Clifford Lee Brownell and Jesse Feiring Williams. New York: American Book Company, 1946. 310 pp. Price, \$1.52.*

This is a textbook on anatomy and physiology for upper grade school youngsters. Technical facts are simply stated and are subject to the usual errors of simplification so common to first editions. Collaboration with a physiologist would have been helpful. Perhaps junior high school children should not know that the human body has a reproductive system, since it is omitted in this text.

The anatomical diagrams are excellent and photographic cuts of youth activities may intrigue children. The hygiene content is incidental and will probably be either enlarged or deleted in future editions. "Questions and Problems for Discussion" and "Things to Do," which come at the end of each chapter, are good devices for busy teachers. A good glossary and subject index add to the value of the book.

CHARLES E. SHEPARD



**The Freezing Preservation of Foods**—By *Donald K. Tressler and Clifford F. Evers*. New York: *Avi Publishing Company* (2nd ed.). Revised and Enlarged, 1947. 932 pp. Price, \$10.00.

The 25 chapters of this handbook cover thoroughly the technology and science of frozen foods. Chapters of particular interest to public health workers deal with nutritive values, microbiology, changes occurring in preparation, freezing, storage, and thawing, and the importance of quality control and standards. Full directions for the preparation, freezing, and handling of fruits, fruit juices, poultry, meat, dairy products, fish and shellfish are included.

The importance of the frozen food locker industry is shown by the increase in number of plants in the United States to about 8,000 in 1946. The subjects of freezing equipment, principles of refrigeration, and packaging are adequately covered. The book is up-to-date. The numerous literature references at the end of each chapter make the book particularly useful for the student who desires source material or greater coverage on a particular subject. The 209 illustrations aid materially in clarifying the text and in making the book easy to read.

CARL R. FELLERS

**Ground Water in the Baltimore Industrial Area**—By *John C. Geyer*. Baltimore, Md.: *State Planning Commission*, 1945. Publication 44. 299 pp. Price, \$1.00.

This important and well prepared publication contains considerable information on the ground water resources of the Baltimore industrial area where about 40,000,000 gallons of ground water are pumped each day, chiefly from wells drilled in the Coastal Plain sediments of Cretaceous age. The pumpage of this large quantity of water, together with improper maintenance of wells, has caused several serious ground water problems. These are: contamination of

aquifers by salt and acid waters, decrease in yield of wells, decline in static water levels in wells, and loss of wells from structural failure of screens or casing.

The chief purpose of the publication is to analyze the cause of these problems and to present methods of correcting or preventing them. It also is intended to furnish a basis for further detailed studies. In addition to a detailed analysis of the ground water problems, the publication is well documented with several appendices containing a large amount of factual data, such as records of wells and well logs.

Although the occurrence of ground water in the Baltimore area is complex, the data and interpretations are presented so clearly that the reader should experience no difficulty in obtaining an understanding of the ground water conditions. The publication will be particularly valuable to the numerous establishments in the area that obtain their water supplies from ground water sources. It also will be of interest and value to all persons concerned with the development or study of ground water supplies in other areas.

ROBERT R. BENNETT

**Health and Body Building**—By *Frank Merrill Wheat and Elizabeth T. Fitzpatrick*. New York: *American Book Company*, 1947. 517 pp. Price, \$2.08.

This is a textbook prepared to meet the needs of high school pupils as outlined in the New York State Syllabus for Health Education. The book is conveniently divided into ten units, each headed by a positive statement, e.g., Unit IV—"To Function Efficiently your Body Parts must be in Excellent Health." Each unit is made up of chapters introduced by a question, e.g., "What are the Units and Larger Parts of Body Structure?" These chapters close with suggested things to do and some review questions which emphasize the principal points in the chapter.

The material is, as a whole, scientifically correct and is presented in a manner that is interesting to the adolescent and also may be challenging to those who wish to delve deeper. Emotional appeal is, rightly, almost absent but the appeal of fear is somewhat overused, as is the reference to World Wars I and II. As these events move into the background the references will have less meaning.

Building of character and useful, happy lives has been brought out very well by units on personal health and appearance, mental health and behavior, and community living. The content regarding the anatomy of body systems—digestive, circulatory, musculature, etc.—is covered quite completely, but that of the reproductive system has been left out. This omission was undoubtedly intentional, as many schools will not allow sex education.

This book is more than merely informative of basic scientific facts. It is constructive. It encourages the use of these facts to build "happy, resourceful, productive lives." If but one textbook can be used by pupils, this one appears to be very appropriate.

CATHARINA HUNTSMAN

**Harvey Cushing: A Biography—**  
*By John F. Fulton. Springfield, Ill.: Thomas, 754 pp. 150 illus. Price, \$5.00.*

Here is a first rate biography of a distinguished surgeon whose professional life was spent at Hopkins, Harvard, and Yale. Written by Dr. John F. Fulton, Sterling Professor of Physiology at Yale, the style is reminiscent of that which Cushing set for his life of William Osler.

Although Cushing was a neurological surgeon, his influence was a wide one and such fields as endocrinology and the history of medicine were greatly enriched by his contributions. In later life he took an interest in the field of social medicine and lent his influence to the

study of public medical care and health insurance. He advocated a type of federal organization for public health like that currently proposed in Congress.

For those who fell under Cushing's influence this book is not to be missed. For all it portrays the life of a great doctor in fascinating style.

REGINALD M. ATWATER

**Radio—How, When and Why to Use It—**  
*By Beatrice K. Tolleris. New York: Russell Sage Foundation, 1946. 46 pp. Price, \$1.00.*

In 46 fact packed pages, this booklet analyzes and offers sound solutions to the problems faced by health, welfare, and community organizations who want to reach the radio public.

Knowledge acquired by painful trial and error methods through years of educational broadcasting by organizations throughout the country is assembled here. As a standard textbook on radio broadcasting for non-profit agencies, it belongs in the reference library of every organization that is using or planning to use radio in its public relations program.

A guide to the organization that is just embarking upon the use of radio media, it is also a check list against which agencies can test the effectiveness of their existing programs.

In six readable sections, interspersed with enlightening examples taken from current programs, the booklet discusses points to be considered in deciding whether radio is the medium needed. It describes the various types of program formats, the purpose each serves, and how to use them effectively. It points up the advantages and disadvantages of joining with other organizations in coöperative broadcasts and in securing guest time on existing local and network programs. It offers suggestions for getting time on the air, for maintaining mutually beneficial relations with

the radio stations, and for building up the audience you want to reach.

JEAN HENDERSON

**Vitamins and Hormones—Advances in Research and Applications, Vol. IV.** Edited by Robert S. Harris and Kenneth V. Thimann. New York: Academic Press, 1946. 406 pp. Price, \$7.00.

The excellence of the fourth volume of this series indicates that there is sufficient progress in the field of vitamins and hormones to warrant yearly reviews, and that the editors are able to obtain capable contributors. It is immediately evident to the reader, and the editors comment on the fact, that three chapters in the volume deal specifically with interrelationships between nutrition and hormones: Effect of B Vitamins on the Endocrinological Aspects of Reproduction, by Hertz; Nutritional Therapy of Endocrine Disturbances, by Biskind; and the Protein Anabolic Effects of

Steroid Hormones, by Kochakian. The first three chapters should be especially valuable to public health workers. Pfiffner and Hogan present a very readable and yet thoroughly complete summary of The Newer Hematopoietic Factors of the Vitamin B-Complex. Regardless of all additional knowledge which must of necessity become available with further work, the chapter on Nutrition and Resistance to Infection will remain a classic in this field. The chapter by Clements on Manifestations of Nutritional Deficiency in Infants will be very useful, although the subject is presented in a textbook form rather than as a critical review of recent research. The remaining chapters include timely subjects reviewed by well known workers in each of the fields: The Thyroid and Diabetes, by Houssay; Thyroactive Iodinated Proteins, by Reineke; and Methods of Bioassay of Animal Hormones, by Thayer.

C. A. ELVEHJEM

## BOOKS RECEIVED

*Listing in this column acknowledges the receipt of books and our appreciation to the senders. Space and the interests of readers will permit review of some, but not all, of the books listed.*

**A CASE WORK APPROACH TO SEX DELINQUENTS.** Rosa Wessel. Editor. Philadelphia: Pennsylvania School of Social Work, 1947. 132 pp. Price, \$1.50.

**THE HEALTH EXAMINATION** (rev. ed.). New York: Community Service Society, 1947. 42 pp.

**MALARIA CONTROL ACTIVITIES IN GREECE DURING 1946** (mimeo.). By Dr. Gr. A. Livadas and Dr. George D. Belice. Athens, 1946. 22 pp.

**NURSING FOR COMMUNITY HEALTH.** By Theda L. Waterman, R.N. (2nd ed.) Philadelphia: Davis, 1947. 421 pp. Price, \$3.50.

**NUTRITIONAL AND VITAMIN THERAPY IN GENERAL PRACTICE.** By Edgar S. Gordon, M.D. (3rd ed.) Chicago: Year Book Publishers, Inc., 1947. 410 pp. Price, \$5.00.

**PENICILLIN THERAPY.** By John A. Kolmer, M.D. (2nd ed.) New York: Appleton-Century, 1947. 339 pp. Price, \$6.00.

**PROCEEDINGS OF THE NATIONAL CONFERENCE OF SOCIAL WORK.** New York: Columbia University Press, 1947. 608 pp. Price, \$5.00.

**PUBLIC AGENCY — COUNCIL RELATIONSHIPS.** Health & Welfare Planning Dept. New York: Community Chests and Councils, Inc., 1946. 48 pp. Price, \$.75.

**REHABILITATION THROUGH BETTER NUTRITION.** By Tom D. Spies, M.D. Philadelphia: Saunders, 1947. 94 pp. Price, \$4.00.

**THE RELATION OF DISEASES IN THE LOWER ANIMALS TO HUMAN WELFARE.** By William A. Hagan, et al. New York: New York Academy of Sciences, 1947. pp. 351-576.

**TOMORROW'S FOOD.** By James Rorty and N. Philip Norman, M.D. New York: Prentice-Hall, Inc., 1947. 258 pp. Price, \$3.50.

**VETERINARY BACTERIOLOGY.** By I. A. Merchant. (3rd ed.) Ames, Iowa: Iowa State College Press, 1946. 683 pp. Price, \$7.00.

## A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

**Good News for Young Mothers—** Research in the prophylactic possibilities of gamma globulin yields the following findings: if given within 6 days of exposure it prevents measles 4 times out of 5 and modifies the infection in almost all other cases; given early, and in hefty doses it reduces the case incidence of infectious hepatitis; it seems likely that it may help against scarlet fever, but not against poliomyelitis, chickenpox, or infantile diarrhea. When processed from convalescent plasma, the homologous globulin is effective against mumps and whooping cough.

BERENBERG, W. Gamma Globulin as a Prophylactic and Therapeutic Agent in Communicable Disease. *Milbank Quart.* 25, 2:115 (Apr.), 1947.

**Experience Is Essential to Knowledge—**“Words are not tools for teaching nutrition.” I’m tempted to let the quote stand alone as the annotation for this stimulating discussion. I’ve decided I will, for if it doesn’t tease you into hunting out the paper, nothing will.

BOSELY, B. A Practical Approach to Nutrition Education for Children. *J. Am. Dietet. A.* 23, 4:304 (Apr.), 1947.

**Remember Typhoid Mary?—**Seems like old times to run across a lecture on typhoid carriers. This senior officer from the British Ministry of Health rather ponderously declares that carriers may be found by resourceful detective work, involved bacteriologic techniques, and teamwork by experts in the field.

BRADLEY, W. H. Methods Adopted in the Detection of “The Carrier.” *J. Roy. Inst. Pub. Health & Hyg.* 10, 3:86 (Mar.), 1947.

**“Have a Health Examination.”—**Among the lessons learned from six hard and lean years of promoting prepaid

medical care plans is this one: thorough physical examinations and (except by hypochondriacs) medical consultation on general conditions of health are *not* sought by patients. Those of us who prate about semi-annual physical examinations after 40 as the solution to the cancer problem should digest this bit of gristle.

CARLTON, W. The Problem of Social Medicine: Equilibrating the Distribution and Technology of Medical Care. *New England J. Med.* 236, 14:493 (Apr. 3), 1947.

**Richettsias Condensed —**Reduced to practical details, this discussion of the rickettsial diseases and their vectors is addressed to nurses but it is just as appropriate for inspectors or medical social workers or whatever specialty in the public health field you happen to be pursuing.

DYER, R. E. What the Public Health Nurse Needs to Know about Rickettsial Diseases. *Pub. Health Nurs.* 39, 3:124 (Mar.), 1947.

**Booster Doses, the Answer—**Virulent diphtheria swept through a girls’ school (British) in which 94 per cent of the children had been immunized and 80 per cent were found Schick-negative. Ruefully concludes the reporter, even a highly immunized community is not entirely safe. Don’t you love the “entirely” understatement? In following papers two other doctors (from Belgium and India) report upon penicillin in the treatment of diphtheria.

FANNING, J. An Outbreak of Diphtheria in a Highly Immunized Community (and two related papers). *Brit. M. J.* 4498:371 (Mar. 22), 1947.

**Rheumatic Fever Follows Strep Epidemics—**Two per cent of all school children in the United States have heart disease as a result of rheumatic fever.

This is the first of many accusations directed at the worst of the enemies of childhood. Every youngster with a streptococcal throat infection is a potential rheumatic fever subject, says this writer, who tells what to do about it.

GRIFFITH, G. C. Rheumatic Fever. *J.A.M.A.* 133, 14:975 (Apr. 5), 1947.

**One for Air Sterilization—**Contagion due to contact between patients cannot be prevented by ultraviolet air sterilization, say these researchers, but the lights do prevent air-borne distant spread of infection and—for custodial institutions—the cost is justified.

HIGGINS, R. A., and HYDE, G. M. Effect of Ultraviolet Air Sterilization upon Incidence of Respiratory Infections in a Children's Institution. *New York State J. Med.* 47, 7:707 (Apr. 1), 1947.

**Science Leavened with Common Sense—**"And the School Nurse" might have been omitted from the title of this brief review of recent findings in child development and new-day trends in child care, for it is a useful paper for all who have anything to do with the health of youngsters.

HILDRETH, G. Child Development and the School Nurse. *Pub. Health Nurs.* 39, 4:181 (Apr.), 1947.

**Mind Over Matter—**Steel workers were divided into three groups: one received vitamin pills, the second placebos, the third nothing. Later the groups were reversed. There was no indication that the vitamins had any measurable effect. Absenteeism due to illness was lowest in the placebo group. There was less *voluntary* absenteeism in both vitamin and placebo groups than in the pill-less third.

IVY, A. C., *et al.* The Effect of Administering a Vitamin Supplement, in Capsules, to Groups of Workers in a Steel Industry. *Indust. Med.* 16, 4:163 (Apr.), 1947.

**Working at Pertussis Prevention—**Presented here is convincing evidence

that both the morbidity and mortality rates of whooping cough are lowerable by community vaccination programs. Booster doses of combined whooping cough and diphtheria antigen are needed at school entrance, for then the child meets increased exposure to both diseases.

KANDLE, R. P. The Control of Whooping Cough. *Pub. Health News* (New Jersey State Department of Health). 28, 8:229 (Apr.), 1947.

**Seasons and Polio—**Does poliomyelitis virus persist in urban sewage all the time? If it does would this fact seem to suggest that outbreaks are due to lowering of human resistance at certain seasons? Well, with the most sensitive methods at his command, this researcher could recover virus from sewage only in epidemic years and then only in late summer and early fall. It cannot be concluded from his study that the nature of epidemics is due to seasonal variation in host susceptibility.

MILNICK, J. L. Poliomyelitis Virus in Urban Sewage in Epidemic and Nonepidemic Times. *Am. J. Hyg.* 45, 2:240 (Mar.), 1947.

**Bricks Without Straw—**Administrators who are hard up now for doctors to staff their agencies or institutions will find little comfort in the Surgeon General's prophesy that, if present training programs are not enlarged, we shall be short 30,000 doctors by 1960. The number of dentists needed, and not being trained, verges on the astronomical. When it comes to future shortages of nurses, the S. G.'s prophetic powers fail him.

PARRAN, T. Hospitals and the Health of the People. *J.A.M.A.* 133, 15:1047 (Apr. 12), 1947.

**Big Job Well Done—**Ninety-five doctors, nurses, dentists and dental hygienists work a full school day to improve the health of 116,000 Pittsburgh school children and this service costs \$2.70 per child. If you are interested.

you will find<sup>1</sup> the working plan outlined for your benefit.

SMITH, L. M. Health Service in the Pittsburgh Schools. *J. School Health*. 17, 4:95 (Apr.), 1947.

**Problems of Out-and In-Migration**  
—Though our farm population increased by more than 1¼ millions in two recent years it was still smaller, by 11 per cent, than in 1940, and smaller than it had ever been in the last fifty years. Though a severe depression might boost farm in-migrations, it is not likely otherwise that we shall ever again see so large a part of all Americans living on farms as in 1940. This phenomenon

has many social and hygienic implications. Does it have any bearing on your future job?

TAEUBER, C. Recent Trends of Rural-Urban Migration in the United States. *Milbank Quart.* 25, 2:203 (Apr.), 1947.

**"So High and Mighty"**—What pregnant women worry about and how public health nurses can help in this mental hygiene problem are discussed here. We need more practical papers like this. One guided mother-to-be characterized her guide with the quotation above.

ZIMMERMAN, K. A. The Public Health Nurse and the Emotions of Pregnancy. *Pub. Health Nurs.* 39, 2:63 (Feb.), 1947.

## ASSOCIATION NEWS

### VOCATIONAL COUNSELING AND PLACEMENT

The Association's Vocational Counseling and Placement Service frequently receives inquiries from weary employers who have been struggling without sufficient personnel. The question generally asked is: "What percentage of the vacancies now existing for physicians, nurses, engineers, and other professional groups can be expected to be filled this year, next year, by 1950?"

The accredited schools of public health in the United States have increased their enrollment considerably during the academic year just ending. According to preliminary figures compiled by the U. S. Public Health Service, the graduate student enrollment was 63 per cent higher during 1946-1947 than during the academic year 1945-1946. The total number of graduate students from the United States and the Territories was 521. Of these, 155 were physicians, 137 health educators, 41 engineers, 53 laboratory workers, 27 statisticians, 37 nurses, and the remaining students were representatives of other professional groups. Among the native students, at least 56 per cent were already committed to an employer at the time they entered school. According to information at hand, many of the remaining 44 per cent had already found employment for the end of the current school year.

It is difficult to estimate how long it would take to fill existing vacancies at the present rate of training since there are no recent overall figures available. The statistics of the Vocational Counseling and Placement Service of the American Public Health Association offer a representative picture, although

not a complete one. At the last count, a total of 738 openings was registered as against a total of 157 candidates for positions. Among the openings, 408 were for physicians (at least one-fourth requiring an M.P.H. degree). This means that it would take almost the total enrollment of physicians in schools of public health in 1946-1947 to fill only the vacancies requiring an M.D. and an M.P.H. degree as known to the Vocational Counseling and Placement Service. The statistics of this Service reflect the same discrepancies of demand and supply for public health engineers, trained health educators, and statisticians.

A large number of openings still exists in the field of public health nursing. A recent survey of nursing needs in public health agencies conducted by the U. S. Public Health Service reveals that the total number of vacancies expected on July 1, 1947, will approximate 3,500. This figure exceeds the full-time enrollment of nurses at schools of public health nursing and schools of public health.

A consideration of the enrollment at schools of public health, public health engineering, and public health nursing would not give a complete picture of personnel resources since most agencies, as part of their recruitment efforts, will accept newcomers without a public health degree, planning to send them to school at a later date. It is difficult to evaluate at this point how effective recruitment measures conducted by various official and voluntary agencies have been. The American Public Health Association's Vocational Counseling and Placement Service has taken every opportunity to recruit personnel. It was

first established in the fall of 1945 as a cooperative project of the U. S. Public Health Service and the A.P.H.A. One of its prime objectives was to attract to the public health field men and women who received pertinent training and experience in the armed forces. Recruitment is carried on primarily through counseling on an individual basis. In addition, talks to groups of college students, conferences with counselors in related agencies, and other

collective measures, such as publication and distribution of vocational booklets, are parts of the program.

Low salaries are only part of the explanation for our present shortage of personnel. The advantages of careers in the field of public health are not sufficiently known to young people deciding upon their future vocation. The gap can be closed through efficient and energetic recruitment wherever and whenever possible.

## APPLICANTS FOR MEMBERSHIP

*The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.*

### *Health Officers Section*

John A. Bargcr, M.D., Municipal Courts Bldg., Room 19, St. Louis 3, Mo., Supervisor, Venereal Disease Control Service, City Health Dept.  
 Bernard Bucove, M.D., D.P.H., Medical Health Officer, Weyburn, Saskatchewan, Canada  
 Newman H. Dyer, M.D., 101 50th St., S.E., Charleston, W. Va., State Health Commissioner  
 James A. Fields, M.D., Health Dept., South Boston, Va., Health Officer  
 William H. Handel, M.D., 134 W. Eagle St., Buffalo 2, N. Y., Medical Director, Erie County Health Dept.  
 Vincent H. Handy, M.D., M.P.H., 374 Delaware Ave., Buffalo, N. Y., Asst. District Health Officer, State Health Dept.  
 John J. Hanson, Health Dept., City Hall, New Brunswick, N. J., Health Officer  
 Noka B. Hon, M.D., U. S. Public Health Service, Bethesda, Md., Asst. Chief, States Relations Division  
 Gerald L. Infield, M.D., 707 Shore Road, Northfield, N. J., City Health Officer  
 Samuel C. Ingraham, II, M.D., M.P.H., State Planters Bank Bldg., Richmond, Va., Surgeon, U. S. Public Health Service District No. 2  
 Lt. Col. Paul H. Leach, M.C., 615 N. Wolfe St., Baltimore, Md., Student, School of Hygiene and Public Health, Johns Hopkins Univ.  
 Herbert L. Mantz, M.D., 618 Professional Bldg., Kansas City, Mo., Tuberculosis Controller, City Health Dept.

Byron O. Mork, Jr., M.D., Worthington Clinic, Worthington, Minn., Chairman, County Public Health Nursing Committee  
 Andrew W. Orlowski, M.D., 19 Mason St., Torrington, Conn., City Health Officer  
 Jorge Quinteros C., M.D., Calle Mexico No. 152, La Paz, Bolivia, S. A., Director, Dept. of Venereal Diseases, Cooperative Service of Public Health  
 Leo Schnur, M.D., Pima Indian Reservation, Sacaton, Ariz., Senior Physician, Office of Indian Affairs  
 Tito Lopes da Silva, M.D., Rua Guadalupe 725, Sao Paulo, Brazil, S. A., Public Health Officer, Sao Paulo State Public Health Dept.  
 Louis B. Thomas, M.D., Idaho Rapid Treatment Center, Box 2637, Boise, Ida., Asst. Surgeon (R), U. S. Public Health Service  
 Eugene Walker, M.D., C.M., 759 Chestnut St., Springfield 7, Mass., Supt., The Springfield Hospital  
 Robert L. Zobel, M.D., M.P.H., 603 State Planters Bank Bldg., Richmond, Va., Surgeon, U. S. Public Health Service

### *Laboratory Section*

Edward H. Armbruster, M.S., School of Public Health, Univ. of Michigan, Ann Arbor, Mich., Research Assoc. in Public Health Engineering  
 Laurice Bailey, 741 Culbertson Drive, Oklahoma City, Okla., Laboratory Technician, State Dept. of Health  
 Ernest J. Barnard, 827 W. Maple St., Johnson City, Tenn., Director, Johnson City Branch Laboratory, State Health Dept.  
 Eva G. Bernhardt, M.S., 1 Agnew St., Montgomery 6, Ala., Junior Bacteriologist,



Division of Laboratories, State Dept. of Health

Mildred F. Claiborne, 1812 McClung St., Charleston, W. Va., Acting Supervisor, Water and Milk Division, State Hygienic Laboratory

Maryann E. Coulson, 14356 Greenleaf St., Sherman Oaks, Calif., Laboratory Asst. Veterans Administration

Herald R. Cox, ScD., Lederle Laboratories, American Cyanamid Co., Pearl River, N. Y., Director of Viral and Rickettsial Research

Sidney J. Coyne, 1140 South Michigan Blvd., Chicago 5, Ill., Director, Enoz Research Laboratory

Deane C. Epler, M.D., Bozeman, Mont.

Carlos de la V. Espana, M.S., Hooper Foundation, Univ. of Calif., Medical Center, San Francisco 22, Calif., Fellow, National Foundation for Infantile Paralysis

Dale O. Galloway, Chilhowee Drive, Rt. 6, Knoxville, Tenn., Student, Univ. of Tennessee

Jesshill Love, M.D., 509 Brown Bldg., Louisville, Ky., Director, Cancer Clinic

Solomon M. Michaelson, D.V.M., 1967 81st St., Brooklyn, N. Y., Laboratory Asst., City Dept. of Health

Richard C. Montgomery, M.S., State Health Dept., Hagerstown, Md., Assoc. Bacteriologist, State Dept. of Health

Esther L. Morgan, Box 209, Flagstaff, Ariz., Senior Bacteriologist, State Dept. of Health

Richard A. Morrissey, M.P.H., State Dept. of Public Health, Div. of Labs., Springfield, Ill., Bacteriologist

John L. Neal, 1800 West Fillmore, Chicago, Ill., Immunologist, State Dept. of Public Health

Joseph Portnoy, M.S., Pan-American Sanitary Bureau, Apt. 383, Guatemala City, Guatemala, C. A., Assoc. Serologist, Venereal Disease Research Laboratory

Arthur H. Razee, 131 West St., Mansfield, Mass., Manager, Chemical Service, Rumford Chemical Works, Rumford, R. I.

Ethel M. Schuler, 333 E. 16th Ave., Denver, Colo., Chemist, City Health Dept.

Juan Talavera, D.V.M., Calle Iturbe, 14, Madrid, Spain, Inspector Veterinarian, Direccion General Ganaderia

Tien-hsing Yieh, M.D., D.P.H., 90 Church St., New York, N. Y., Bacteriologist, First Army Laboratory

ington, D. C., Medical Research Officer, Veterans Administration

Jesse B. Lasater, 4941 Arsenal St., St. Louis 9, Mo., Registrar, Bureau of Vital Statistics, Division of Health

Marinus G. Neurdenburg, M.D., D.P.H., Frans van Mierisstraat 134, Amsterdam Zuid 1, Holland, Public Health Officer and Chief of Statistics, Municipal Medical and Public Health Service

#### *Engineering Section*

Jose Arrisueno, 362 Bellavista, Miraflores, Lima, Peru, S. A., Student, Harvard University, School of Engineering

Max L. Barrett, 1700 N. Harrison St., Fort Wayne, Ind., Sanitary Engineer, State Board of Health

Edward M. Bivins, 559 Pacific St., Monterey, Calif., Sanitarian, Bureau of Sanitation, State Dept. of Public Health

Ross W. Buck, 605 Volunteer Bldg., Atlanta, Ga., S. A. Engineer (R), Training Division, Typhus Fever and Rodent Control, U. S. Public Health Service

Hernando Correal, 611 Church St., Ann Arbor, Mich., Student, School of Public Health, Univ. of Michigan

Edgar E. Diddams, M.S.P.H., City Hall Annex, Tacoma, Wash., Chief, Division of Sanitation, City Health Dept.

Ernest P. Dubuque, 2306 Westminster Way, N.E., Atlanta 6, Ga., S. A. Engineer (R), In charge of In-service Training, U. S. Public Health Service, Communicable Disease Center

Urano C. Eichenberg, M.P.H., Rua Hoffmann 740, Porto Alegre, R.G.S., Brazil, S. A., Student, School of Public Health, Univ. of Michigan

Roy F. Fritz, M.S., 605 Volunteer Bldg., Atlanta, Ga., Entomologist, Typhus Branch, Communicable Disease Center, U. S. Public Health Service

Harold S. Griswold, 400½ East Vantrees St., Washington, Ind., Sanitary Engineer, State Board of Health

Nathan I. Kass, 167 Beaumont St., Brooklyn 29, N. Y., Sanitary Engineer, Dept. of Public Works

Philip H. Kime, Princess Anne, Va., Sanitation Officer, State Health Dept.

LaRue L. Miller, State Dept. of Health, Bureau of Eng., Lansing 4, Mich., Chief, Division of Environmental Sanitation

Floyd A. Reese, 702 Municipal Bldg., Akron, Ohio, Director of Sanitation, City Dept. of Health

Rudolph C. Rosine, 156 Walnut Ave., Galesburg, Ill., Sanitarian, Division of Sanitary

#### *Vital Statistics Section*

Benjamin L. Gotham, M.A., Box 932, U. S. Public Health Service, Pharr, Tex., Field Statistician, Communicable Disease Center

Lee Jarvis, M.S., 2619 42nd St., N.W., Wash-

Engineering, State Dept. of Public Health  
Claude R. Stonchouse, 1729 Hampshire Rd.,  
Victoria, B. C., Canada, Senior Sanitarian,  
Provincial Health Dept.

Clifford N. Stutz, M.S., 1009 N. Park St.,  
Bloomington, Ill., Sanitary Engineer,  
McLean County Health Dept.

E. A. Turner, P. H. and W-Sec., G.H.Q.-SCAP,  
APO 500, San Francisco, Calif., Sanitary  
Engineer Consultant to Chief of Public  
Health and Welfare Section

Mario R. Valdes P., 309 E. Catherine, Ann  
Arbor, Mich., Student, School of Public  
Health, Univ. of Michigan

#### *Industrial Hygiene Section*

Benjamin F. Aramayo O., M.D., Calle Yana-  
cocha 735, La Paz, Bolivia, S. A., Industrial  
Hygiene Physician, Caja de Seguro y Ahorro  
Obrero

Manuel Caceres C., 499 Pennsylvania Ave.,  
N.W., Washington, D. C. 25, Industrial  
Hygiene Engineer, Institute of Inter-Ameri-  
can Affairs, Training Division

William Y. L. Chen, M.D., 615 N. Wolfe St.,  
Baltimore, Md., Student, Johns Hopkins  
University. School of Hygiene and Public  
Health

W. Parker Hall, R.N., 382 Park Road, West  
Hartford, Conn., Industrial Hygiene In-  
spector, Pratt and Whitney Aircraft Co.

B. Dixon Holland, M.D., 2A Maple Drive,  
Baltimore 20, Md., Student, Johns Hopkins  
University, School of Hygiene and Public  
Health

Robert Learmonth, D.V.M., 5757 Franklin  
Ave., Los Angeles, Calif., Veterinarian

Bernard L. Murray, Box 132, St. Albans, W.  
Va., Sanitarian, Carbide and Carbon  
Chemicals Corp.

L. Phelps Stanley, M.D., 437 McCorkle Ave.,  
South Charleston, W. Va., Medical Division,  
Carbide and Carbon Chemicals Corp.

#### *Food and Nutrition Section*

Rowland Burnstan, Sc.D., 105 E. 22nd St.,  
New York 10, N. Y., Exec. Director, State  
Charities Aid Assn.

Mary A. Crenshaw, M.S., 620 S. 3rd St.,  
Louisville, Ky., Nutritionist, State Dept. of  
Health

Sally E. Frey, 631 J. St., Sacramento, Calif.,  
District Nutritionist, Bureau of Maternal  
and Child Health, State Dept. of Public  
Health

Alfred T. Jones, 501 5th, P. O. Box 95, Abbe-  
ville, La., Regional Milk Sanitarian, State  
Dept. of Health

Capt. Ernest M. Parrott, Sn.C., Hq. 1st Army,

Surgeons Office, Governors Island, New  
York, N. Y., Nutrition Consultant

Prof. Alice B. Peyton, 2061 Cornell Rd.,  
Cleveland, Ohio, Asst. Professor of Nutrition  
and Dietetics, Western Reserve Univ.

Orrea F. Pye, Ph.D., Columbia University,  
Teachers College, New York 27, N. Y.,  
Assoc. Professor of Nutrition

Della L. Reiswig, 1102 Oakland Ave., Ann  
Arbor, Mich., Student, School of Public  
Health, Univ. of Michigan

Margaret E. Smith, M.S., 111 Avenue Road,  
Toronto 10, Ont., Canada, Director, Nutri-  
tion Division, Health League of Canada

Martha F. Trulson, M.P.H., 312 South Page  
St., Stoughton, Wis., Chief Nutritionist,  
Regional OPD (Chicago), Veterans Adminis-  
tration

Elisabeth Whipple, M.S., 1001 Huron Rd.,  
Room 1016, Cleveland 15, Ohio, Director,  
Nutrition Association of Greater Cleveland

#### *Maternal and Child Health Section*

Hazel A. Bulifant, 1119 E. Fifth St., El Paso,  
Tex., Nurse, Newark Maternity Center

Manuel A. Falquez, M.D., Calle 74 No. 29  
C-23, Barranquilla, Colombia, S. A., Direc-  
tor Tecnico del Hospital Infantil San  
Francisco de Paula

Virginia F. Handfield, R.N., Doerun, Ga.,  
Student, Peabody College

Whitney C. Jansen, M.A., 188 West Randolph  
St., Room 2200, Chicago 1, Ill., Administra-  
tive Methods Consultant, U. S. Children's  
Bureau

Milton G. Johnson, A.M., Santa Fe Bldg.,  
Room 125, Dallas, Tex., Regional Adminis-  
trative Methods Consultant, U. S. Children's  
Bureau

Charles F. Mitchell, M.A., 441 W. Peachtree  
St., Atlanta 3, Ga., Regional Administrative  
Methods Consultant, U. S. Children Bureau

Rafael Ramirez-Suarez, M.D., M.P.H., Fran-  
cisco Ayala 101, Col. Vista Alegre, Mexico,  
D. F., Mexico, Oficial Medico Sanitario,  
Estacion de Adiestramiento en Mexico

Frederick F. Tisdal, M.D., 55 College St.,  
Toronto, Ont., Canada, Asst. Professor of  
Pediatrics, Univ. of Toronto

Yoshiye Togasaki, M.D., 1850 Buchanan St.,  
San Francisco 15, Calif., Medical Officer,  
Maternal and Child Health, State Dept. of  
Public Health

#### *Public Health Education Section*

Sister M. Aloysia, 8200 W. Outer Drive,  
Detroit, Mich., Student, Univ. of Michigan

Alice B. Ballard, R.N., 571 Maxwell Ave.,  
Greenwood, S. C., County Nurse, Green-  
wood County Tuberculosis Assn.

- Opal Carl, R.N., State Health Dept., Educational Unit, Minneapolis, Minn., Community Health Education Consultant
- George W. Cooley, 535 N. Dearborn St., Chicago, Ill., Asst. Secy., Council on Medical Service, American Medical Assn.
- Herbert K. Cooper, D.D.S., 26 N. Lime St., Lancaster, Pa., Lecturer on Public Health Dentistry
- William K. Curfman, M.A., 312 W. 9th St., Cincinnati 2, Ohio, Exec. Director, Anti-Tuberculosis League of Cincinnati
- Frances E. Goldberg, 853 First Ave., New York 17, N. Y., Supervisor of Field Work, Milbank Memorial Fund
- William M. Hartnett, 818 Olive St., St. Louis, Mo., Supervisor, St. Louis District Office, Division of Vocational Rehabilitation
- Anne S. Hubbell, 33 E. 22nd St., New York 10, N. Y., Supervisor of Field Work, Milbank Memorial Fund
- James B. Karnowski, 315 Roosevelt, Topeka, Kan., Accountant, State Board of Health
- Mary Lou King, M.S.P.H., 906½ Travis St., Houston 2, Tex., Exec. Secy., Harris County Unit, American Cancer Society
- Anne J. Lello, Box 204, Winfield, Kan., Staff Nurse, Joint Health Dept.
- Frances MacDonald, 321 S. 8th St., Bozeman, Mont., Extension Specialist in Rural Health Services, Montana Extension Service
- Blanche R. Miller, R.N., 312 W. 9th St., Cincinnati, Ohio, Health Education Secretary, Anti-Tuberculosis League of Cincinnati
- Catharine E. Nourse, 2455 Ala Wai Blvd., Honolulu, Hawaii, Occupational Therapy Consultant, Bureau of the Crippled Child, Board of Health
- Lorenzo G. Runk, Jr., M.D., Box 100, Philipsburg, Pa., District Medical Director, State Dept. of Health
- C. Lucille Russ, M.S.P.H., P. O. Box 209, Clarksdale, Miss., Health Educator, Coahoma County Health Dept.
- Olive E. Sayles, 47 Beaver St., New York, N. Y., Editor, Cancer News, American Cancer Society
- Harvey T. Sethman, 835 Republic Bldg., Denver 2, Colo., Exec. Secy., Colorado State Medical Society
- Karl F. Wette, M.D., 101 N. Van Buren, Rockville, Md., Director, Tuberculosis Control, Montgomery County Health Dept.
- William W. Wightman, M.D., 121 S. Highland Ave., Pittsburgh 6, Pa., First Vice-President, General Health Council of Allegheny County
- Alaska, Public Health Nurse, Seward Public Health Nursing Service
- Virginia T. Brauchle, R.N., 139 Maple Ave., Irvington, N. J., Public Health Nurse, Irvington Health Dept.
- Geraldine A. Busse, R.N., District Health Service No. 10, Centerville, Iowa, Advisory Nurse
- Margaret C. Butts, R.N., 40 Monroe St., New York 2, N. Y., Professional Reviewer and Nurse Consultant, Metropolitan Life Insurance Co.
- Alice FitzGerald, R.N., 580 Fifth Ave., New York 19, N. Y., Exec. Director, Association for the Aid of Crippled Children
- M. Eloise Foote, 508 Octavia St., San Francisco, Calif., Staff Nurse, San Francisco Dept. of Public Health
- Louella Gaines, 44 W. 95th St., New York, N. Y., Public Health Nurse, City Dept. of Health
- Lilly Harman, Dade County Health Dept., Court House, Room 806, Miami, Fla., Director of Nurses
- Penelope K. Hope, R.N., 216 North Mulberry St., Marshall, Mich., Supervising Nurse, Calhoun County Health Dept.
- Phyllis H. Layne, R.N., 2604 Bird St., Hannibal, Mo., Staff Nurse, Metropolitan Life Insurance Co.
- Laura M. Loring, R.N., 20-A Jewett Place, Utica, N. Y., District Supervising Nurse, State Dept. of Health
- Mildred V. Lucka, 515 Main St., Youngstown, Pa., Administrator, Central, Service for the Chronically Ill, Health Division, Council of Social Agencies
- Catherine E. Ludlow, R.N., 2538 Erie Ave., Cincinnati, Ohio, Supervising Public Health Nurse, Cincinnati Board of Health
- Ann K. Magnussen, R.N., 230 Spring St., Atlanta 3, Ga., Director of Nursing Services, American Red Cross
- Capt. Mary L. Mills, 5676, USPHS, Unit 2, Roberts Field, Liberia, APO 194 Postmaster, New York, N. Y., Public Health Mission to West Africa
- Hazel E. Owen, R.N., Shawnee County Health Dept., Topeka, Kan., Asst. Nurse Officer, U. S. Public Health Service
- Cecelia M. Petrie, R.N., 227 Columbus Ave., Buffalo 20, N. Y., Health Instructor, School of Nursing, Mercy Hospital
- Adrienne C. Proskine, R.N., City Hall, 4th Floor, Binghamton, N. Y., Supervisor, Bureau of Health
- Ruth L. Ryden, R.N., Box 1498, Ketchikan, Alaska, Public Health Nurse, Territorial Board of Health
- Melba R. Scyoc, R.N., 2310 Chestnut, Hanni-

*Public Health Nursing Section*

La Preal F. Arave, R.N., Box 714, Seward,

bal, Mo., Public Health Nurse, State Service for Crippled Children

Mary Shugart, R.N., Box 753, Bemidji, Minn., Advisory Nurse, State Dept. of Health

Henrietta Smellow, Frankford Arsenal, Philadelphia 37, Pa., Student, Univ. of Pennsylvania

Esther M. Thompson, M.A., 31 Prince St., Rochester, N. Y., Director, Dept. of Nursing Education, Univ. of Rochester

Nancyli S. Virgolino de Alencar, 40 Leopoldo Miguez, Apt. 108, Copacabana, Rio de Janeiro, Brazil, S. A., Public Health Nurse, Ministry of Education and Health

Jeannette E. Westlake, R.N., 324 S. 12th St., Lincoln 8, Nebr., S. A. Nurse Officer, Tuberculosis Control Division, U. S. Public Health Service

Beulah White, R.N., Box 751, Jonesboro, Ark., County Public Health Nurse, State Board of Health

#### *Epidemiology Section*

Mahendra J. Bhatt, M.B., D.T.M., 55 Shattuck St., Boston, Mass., Student, Harvard Univ., School of Public Health

Willard H. Eyestone, D.V.M., 55 Shattuck St., Boston 15, Mass., Student, Harvard Univ., School of Public Health

Carlos R. Larde-Arthes, M.D., Dr.P.H., 3944 65th St., Woodside, N. Y., Former Chief of Tuberculosis Control of El Salvador

Milton Mendlowitz, M.D., 136 E. 64th St., New York 21, N. Y.

Col. Charles H. Morhouse, M.C., 55 Shattuck St., Boston 15, Mass., Student, Harvard School of Public Health

Ruth B. Patty, M.S., 16247 Roselawn Ave., Detroit, 21, Mich., Statistician, City Dept. of Health

George M. Saunders, M.D., Washington Univ., School of Medicine, St. Louis 10, Mo., Asst. Professor of Preventive Medicine

#### *School Health Section*

Franklin B. Haar, Ph.D., Univ. of Fla., Gainesville, Fla., Assoc. Professor, College of Physical Education and Health

Elizabeth Kelley, Ed.D., 1676 Vagedes, Fresno, Calif., Health Education Consultant, State Dept. of Education

Carl L. Kline, M.D., Stephens College, Columbia, Mo., Director of Health Education

William A. MacDonald, M.D., D.P.H., Regional Medical Health Officer, Meadow Lake, Sask., Canada

Viola M. Madison, R.N., 270 St. Nicholas Ave., New York, N. Y., Nurse, Social Hygiene Clinic, City Dept. of Health

Jay B. Nash, Ph.D., 675 Education Bldg.,

Washington Sq., New York 3, N. Y., Chairman, Dept. of Physical Education and Health, N. Y. Univ.

Marie A. Schroeder, R.N., 519 S. Euclid Ave., Villa Park, Ill., School Nurse, Board of Education, Wheaton, Ill.

#### *Dental Health Section*

William A. Jordan, D.D.S., M.P.H., 2308 Fremont Ave. S., Minneapolis 5, Minn., Director, Division of Dental Health, State Health Dept.

William I. L. McGonigle, D.D.S., 85 E. Main St., Freehold, N. J., Dentist

E. Stuart Robinson, D.D.S., Box 476, Gooding, Ida., Chairman, Council of Dental Health, Idaho State Dental Society

George E. Waterman, D.D.S., South 14th and C, Richmond, Ind., Dental Officer in Charge, U. S. Public Health Service

#### *Unaffiliated*

Jerome W. Brower, M.A., 469 State Office Bldg., St. Paul 1, Minn., Director, Division of Administration, State Dept. of Health

Col. Robert L. Callison, M.C., Harvard School of Public Health, Boston, Mass., Student

James P. Dixon, Jr., M.D., Episcopal Hospital, Philadelphia 25, Pa., Administrative Intern

Leon du Flon, 219 N. Solano Ave., Albuquerque, N. M., Business Manager, New Mexico Intensive Treatment Center

Walter J. Lear, M.D., Permanente Foundation Hospital, Oakland, Calif., Intern

Neil F. MacDonald, 1222 Connecticut Ave., N.W., Washington 6, D. C., Hospital Consultant, War Assets Administration

Hortense Marion, 201 County-City Bldg., Seattle, Wash., Exec. Secy., King County Chapter, National Foundation for Infantile Paralysis, Inc.

Halley Marques, M.D., 362 Marechal Floriano, Porto Alegre, Rio Grande do Sul, Brazil, S. A., Student, Univ. of Michigan, School of Public Health

Col. Cecil S. Mollohan, M.C., 55 Shattuck St., Boston, Mass., Student, Harvard School of Public Health

Mrs. Bruce Parker, First National Bank, Greeley, Colo., Exec. Secy., Weld County Tuberculosis and Health Assn.

Louis J. Regan, M.D., 1925 Wilshire Blvd., Los Angeles 5, Calif., Director of Medical Relations, Los Angeles County Medical Society

Eugene C. Roberts, Ph.D., Hooper Foundation, Univ. of Calif., Medical Center, San Francisco 22, Calif., Research Asst.

Joseph A. Smith, M.D., New Jersey Sana-

torium, Glen Gardner, N. J., Asst. Medical Director  
 Ray E. Smith, 1021 Hume Mansur Bldg., Indianapolis 4, Ind., Exec. Secy., Indiana State Medical Assn.

#### DECEASED MEMBERS

Claude M. Cook, M.D., Danville, Ill., Elected Member 1941, Health Officers Section  
 Dr. David S. K. Dai, Chengtu, Szechwan, West China, Elected Member 1945, Dental Health Section  
 William G. Exton, M.D., Newark, N. J., Elected Member 1932, Laboratory Section.  
 Mrs. Ruth G. George, R.N., Columbia, S. C., Elected Member 1937, Elected Fellow 1944, Public Health Nursing Section  
 Arthur D. Knott, M.D., D.P.H., Camilla, Ga., Elected Member 1924, Elected Fellow 1933, Elected Life Member 1934, Health Officers Section  
 Bernard V. Lally, M.D., Tiffin, Ohio, Elected Member 1946, Health Officers Section  
 Charles J. Larkey, M.D., Bayonne, N. J., Elected Member 1919, Health Officers Section

Harry J. Nestlebusch, St. Joseph, Mo., Elected Member 1938, Vital Statistics, Section  
 Fred L. Ogilvie, M.D., Caruthersville, Mo., Elected Member 1941, Health Officers Section  
 G. T. Parkinson, M.D., Twin Falls, Idaho, Elected Member 1942, Health Officers Section  
 Anton R. Rose, M.D., Ph.D., Newark, N. J., Elected Member 1924, Laboratory Section  
 Frithjof Setter, Ph.D., Detroit, Mich., Elected Member 1946, Laboratory Section

#### CLOSING DATE FOR SUBMISSION OF FELLOWSHIP APPLICATIONS

August 1 will be the last date on which Fellowship applications can be accepted for consideration at the 1947 Annual Meeting in Atlantic City.

Eligible members who wish to apply for Fellowship this year are therefore urged to send in their applications as early as possible.

#### ERRATA TO NINTH EDITION OF THE STANDARD METHODS FOR THE EXAMINATION OF WATER AND SEWAGE

The following corrections are called to the attention of anyone using the Ninth Edition of the Standard Methods for the Examination of Water and Sewage:

1. Page 24 Sec. 10, B, 1.6. The formula for determining the reagent value of potassium palmitate should read:  $\text{Mg. CaCO}_3$  per ml. potassium palmitate = ml. standard calcium chloride soln  $\div$  ml. potassium palmitate soln.
2. Page 54 Sec. 24, D, 3, line 6 should read: To about 40 ml., add 5 ml. of 3 N HCl. . . .
3. Page 216 Appendix I, left column, Sec. 4, 3, line 31, sentence should read: Copper does not interfere below 0.2 ppm. (Delete the words "the maximum limit permissible accord-

ing to the 'Drinking Water Standards' of the U. S. Treasury Dept.")

The above corrections concern the only errors appearing in the Ninth Edition that have been called to the attention of the editorial staff. Members of the Association and users of the Methods are requested to transmit a record of any other errors discovered to:

REGINALD M. ATWATER, M.D.  
 Executive Secretary,  
 American Public Health Association  
 1790 Broadway, New York 19, N. Y.

**SEVENTY-FIFTH ANNUAL MEETING**  
**AMERICAN PUBLIC HEALTH ASSOCIATION**  
**ATLANTIC CITY, N. J., OCTOBER 6-10, 1947**

**HOTEL RATES, ATLANTIC CITY, N. J.**

**BOARDWALK HOTELS**

<i>Hotels</i>		<i>Total Rooms</i>	<i>Rooms with Bath</i>	
			<i>Single</i>	<i>Double</i>
AMBASSADOR	Brighton Ave.	670	\$6.00-\$9.00	\$9.00-\$14.00
APOLLO	New York Ave.	51		8.00- 12.00
BREAKERS	New Jersey Ave.	475	4.00- 7.00	5.00- 12.00
BRIGHTON	Indiana Ave.	291	7.00-	9.00- 14.00
CHALFONTE-HADDON HALL	North Carolina Ave.	1,000	6.00-10.00	8.00- 18.00
CHELSEA	Morris Ave.	400	5.25- 6.75	6.75- 15.00
CLARIDGE	Park Pl.	406	6.00-14.00	9.00- 17.00
DENNIS	Michigan Ave.	475	6.00- 8.00	9.00- 14.00
MARLBOROUGH-BLENHEIM	Park Pl.	464	6.00-10.00	9.00- 16.00
MAYFLOWER	Tennessee Ave.	280	5.00- 6.00	7.00- 12.00
NEW BELMONT	S. Carolina Ave.	100	5.00- 6.00	7.00- 12.00
PRESIDENT	Albany Ave.	500	7.00-10.00	9.00- 15.00
RITZ-CARLTON	Iowa Ave.	431	6.00- 8.00	9.00- 14.00
ST. CHARLES	St. Charles Pl.	300	5.00-12.00	7.00- 14.00
SEASIDE	Pennsylvania Ave.	235	5.00-11.00	8.00- 14.00
SHELBURNE	Michigan Ave.	300	6.00- 9.00	9.00- 12.00
STRAND	Pennsylvania Ave.	271	4.50- 6.00	9.00- 12.00
TRAYMORE	Illinois Ave.	600	6.00-14.00	9.00- 18.00

**AVENUE HOTELS**

<i>Hotels</i>		<i>Total Rooms</i>	<i>Rooms with Bath</i>	
			<i>Single</i>	<i>Double</i>
BOSCOBEL	Kentucky Ave.	120		\$8.00
CLARENDON	Virginia Ave.			7.00
COLTON MANOR	Pennsylvania Ave.	208	\$5.00-\$9.00	8.00-\$12.00
COLUMBUS	Pacific Ave. at St. James	100		6.00
CRILLON ★	Pacific Ave. at Indiana	49		8.00- 10.00
EASTBOURNE	Pacific Ave. at Park	75		7.50- 8.00
FLANDERS	St. James Pl.	125	5.00	7.00- 9.00
FOX MANOR	Pacific Ave. at Belmont	60		8.00- 10.00
HOLMHURST	Pennsylvania Ave.	100		7.00- 8.00
JEFFERSON	Kentucky Ave.	150	6.00	7.00- 10.00
KENTUCKY	Kentucky Ave.	110	3.50	6.00- 7.00
LAFAYETTE	N. Carolina Ave.	100	5.00- 6.00	8.00- 10.00
MADISON	Illinois Ave.	210	4.50- 6.00	7.00- 10.00
MONTICELLO	Kentucky Ave.	175		7.00
MORTON	Virginia Ave.	300	5.00- 6.00	7.00- 9.00
PENN-ATLANTIC	S. Carolina Ave.	125		7.00
RUNNYMEDE	Park Pl.	75	4.00- 7.50	6.00- 10.00
SENATOR	S. Carolina Ave.	260	4.50- 7.00	7.00- 12.00
STERLING	Kentucky Ave.	83	4.00- 5.00	6.00- 7.00
VILLA D'ESTE	Pacific Ave. at Chelsea	40		8.00- 14.00

★ Rate Includes Breakfast

*See Application Blank, next page*

A MESSAGE FROM THE CIRCULATION  
DEPARTMENT

Because public health workers are notoriously frequent movers hundreds of changes of address are reported to the Circulation Department each month. These changes are recorded promptly. Occasionally, however, a member will write in complaining about non-receipt of *Journals* and report for the first time a new address which has been in effect for several months.

New address notifications received

before the 15th of the month will catch the next issue of the *Journal*. Those received between the 15th and the end of the month will be made with the *Journal* published the month after the next. It will assist the Circulation Department and benefit the individual member if address changes are reported to the Association a month in advance.

Members are also urged to notify their post offices of their new address when they move and to instruct that mail be forwarded.

APPLICATION FOR HOTEL ACCOMMODATIONS

American Public Health Association, October 6-10, 1947

NOTE: Single rooms are very limited in number. Please arrange to occupy twin-bedded rooms.

HOUSING BUREAU, 16 Central Pier, Atlantic City, N. J.

Please reserve the following:

Hotel.....	First Choice	Hotel.....	Fourth Choice
Hotel.....	Second Choice	Hotel.....	Fifth Choice
Hotel.....	Third Choice	Hotel.....	Sixth Choice

..... Room(s) with bath for ..... person(s). Rate \$..... to \$..... per room.

Arriving Atlantic City ..... hour ..... A.M. Leaving ..... P.M.

NOTE: You will receive confirmation direct from the hotel accepting the reservation when made.

Rooms will be occupied by:

Name	Street Address	City	State
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....

## EMPLOYMENT SERVICE

The following pages present information for those seeking qualified public health personnel and for those seeking positions in public health.

This is a service of the Association conducted without expense to the employer or employee.

Address all correspondence to the Employment Service, A.P.H.A., 1790 Broadway, New York 19, N. Y., unless otherwise specified.

### POSITIONS AVAILABLE

(Supplemental to list in May Journal)

**Public Health Staff Nurse** in planned teaching center. Public Health Certificate desirable. Generalized program. Supervision. Opportunity for advanced education in Public Health. Salary depends on qualification. Write to Dr. F. M. Teeple, M.D., M.P.H., Health Commissioner, or Mrs. Esther B. Bartlett, R.N., B.S., Director of Nurses, Wood County Bowling Green General Health District, Bowling Green, Ohio.

**Bacteriologist**, male, with Master's degree and minimum of two years' experience in public health bacteriology. Good opportunity for merited advancement. Apply to Georgia Department of Public Health, Atlanta 3, Ga.

**County Public Health Physicians.** Several positions for qualified public health physicians in Oregon counties. Salary \$6,600 to \$7,800; ample travel and expense allowances; qualifications—graduation from an approved school of medicine; internship; eligibility for medical licensure. Positions under Merit System. Apply to: Mr. A. T. Johnson, Merit System Supervisor, 1022 S.W. 11th Ave., Portland 5, Ore.

**Health Officers** in the Florida State Board of Health. Will need six Health Officers for positions as directors of County and District Health Departments, beginning July 1, 1947. Salaries will run from \$5,700 to \$6,300 per annum, depending on training and experience. Necessary mileage in addition at  $7\frac{1}{2}\phi$  per mile. The State has a Merit System and Retirement System for Security. Address Wilson T. Sowder, M.D., State Health Officer, Box 210, Jacksonville, Fla.

**Nurses** for central California full-time health unit: 1 supervising public health nurse with degree in public health and 3 staff nurses with certificates in public health. Salaries open. Direct inquiries to Dr. C. S. Ambrose, Box 110, Visalia, Calif.

**Educational Supervisor**, experienced, with degree in Public Health Nursing. Staff of 11 nurses; student program; 40

hour week; salary open. Apply. Visiting Nurse Association, Evanston, Ill.

**Positions available:** (1) Public health nursing supervisor, (2) staff nurses for Allegan County Health Department, resort center of Southwestern Michigan. Personnel policies offer: 40 hour, five day week; one month vacation; sick leave; liberal salaries and car maintenance allowance. Attractive rural county of 43,000 population situated on Lake Michigan, less than 150 miles from Detroit and Chicago. Health department established 16 years, budget over \$48,000, capable clerical staff, student training program; new director was recently appointed. Generalized challenging and stimulating program. Write, Arthur G. Baker, M.D., Director, Allegan County Health Department, Allegan, Mich.

**Supervisor** for staff of eight nurses in health department conducting school health demonstration and generalized program. State qualifications in application. Minimum salary \$2,280 and travel allowance. Write Director Joint Health Department, 106½ E. 9th St., Winfield, Kan.

**Public Health Nurses** for generalized nursing program. Salary range \$225-\$255 per month. Under civil service, 40 hour week, vacation and sick leave privileges. Cars furnished. Write Director of Public Health Nursing, City of Seattle, 504 County-City Building, Seattle 4, Wash.

**Medical Social Workers** by State Agency rendering eye medical care to those unable to pay for these services; as well as rehabilitation and physical restoration services. Position requires worker with educational background of R.N. and public health training, who has had experience in the field of medical social case work or with private social agencies. Ability to plan for executing work efficiently is a necessity. Write Box T-1, Employment Service, A.P.H.A.

**Director of County Health Work** in West Virginia State Department of



Health, Charleston. Salary \$6,000 plus travel. Position under state merit system. Qualifications: M.D. with three years' full-time experience in the field of public health. Must be eligible for West Virginia license. Write Dr. N. H. Dyer, State Health Commissioner, State Department of Health, Charleston 5, W. Va.

The Tennessee Valley Authority announces openings in its Health and Safety Department for well qualified physicians. Training and experience in public health and employee medical services are desirable. The entrance salary is \$4,950 per annum, based on a 40 hour week schedule with provision for within grade increases to \$5,900. Retirement, annual, and sick leave benefits are provided. Interested candidates should write the Tennessee Valley Authority, Personnel Department, Knoxville, Tenn.

School Nurse for private school in Hawaii. To live on campus. Responsibilities: general school health and health of approximately 100 boarding school students. Three months summer vacation, 2 and 1 week respectively during school year. Write Box V-1, Employment Service, A.P.H.A.

Health Educator to work in close connection with a city health department in Virginia. Man or woman with M.P.H. degree, able to conduct a demonstration program of community coordination and education. Salary \$3,300 plus car allowance. Write Box W-1, Employment Service, A.P.H.A.

Health Commissioner for combined health district, Ohio, serving population of approximately 40,000. Staff of twelve, adequate budget, established health department (23 years). Salary depends on training and experience. Write Box H-2, Employment Service, A.P.H.A.

Tuberculosis Medical Consultant: Qualifications: M.D. from approved school, internship, two years' medical experience (one year in a tuberculosis hospital, sanatorium or clinic). Salary range: \$5,520-\$6,540 plus traveling expenses. Write Mr. R. B. Beaumier, Administrative Officer, Washington State Department of Health, Smith Tower, Seattle 4, Wash.

Public Health Nurses: Baltimore County Health Department. Population 230,000; urban, suburban, and industrialized areas; county seat 8 miles from Baltimore. Generalized service; director, 3 supervisors, 22 field nurses. Immediate large expansion planned. Beginning salary \$2,000 (for trainee) to \$2,500, depend-

ing on experience and education. Retirement plan; one month's vacation; 5 day, 35½ hour week; sick leave. For use of personal car, allowance of 7 cents per mile. Write to Dr. William H. F. Warthen, Health Officer, Baltimore County Health Department, Towson 4, Baltimore, Md.

Physician for combined position: Assistant Physician, Fall River Tuberculosis Hospital and Admitting Officer at Out Patient Department, Fall River General Hospital. Salary \$1,400 annually plus maintenance. Write Arthur L. Ledoux, M.D., Commissioner, Fall River Board of Health, Fall River, Mass.

School Nurse: Trained in public health, for city near Detroit. Population 18,000, enrollment 3,000. Salary for first year approximately \$2,800. Write Box N-392, Employment Service, A.P.H.A.

Public Health Nursing Supervisor in county of 35,000-100 miles west of Chicago. Must have college degree and public health training. Salary \$250 monthly, plus \$60 travel allowance. Write Box N-394, Employment Service, A.P.H.A.

Supervisor for Louisville General Hospital Laboratories, Louisville, Kentucky, affiliated with the University of Louisville School of Medicine. For details write to Louisville Civil Service Board, City Hall, Louisville 2, Ky. Salary \$250-\$300, depending upon training and experience of applicant.

Staff School Nurse for small, but old and well organized school health department in scenic spot on Pacific Coast. Salary approximately \$2,700, 35 hour week, 9 calendar months, including 2 weeks vacation Christmas, one week Easter. Three summer months free for vacation, study or work. Annual increment for ten years, tenure after three probationary years. Must be under thirty-five, with B.A. and P.H.N. degrees, at least one year's experience in generalized nursing program. When applying send photograph of self, age, degrees, training and experience since receiving P.H.N., marital status, number of children. Position open September, 1947. Write Box N-390, Employment Service, A.P.H.A.

Supervising Public Health Nurse in Municipal Health Department, with four years' experience in PHN. Must have eligibility for Wisconsin registration as a graduate nurse; two semesters' study in PHN; and a bachelor's degree. Beginning salary \$227 month, plus car allowance. Applications will be accepted until the needs of the service are filled. Write

Personnel Department, City Hall, Madison 3. Wis.

**Sanitary Engineer** with experience and training; particularly in sewerage work. Salary range \$270 to \$350 per month depending on experience. Write to J. B. Harrington, Director, Division of Sanitary Engineering, State Department of Health, Charleston, W. Va.

**Public Health Physician** to do communicable disease control work, well child examinations, and be assistant to the director of public health. The communicable disease control work includes epidemiological investigations, the supervision of a tuberculosis x-ray program, and the conduct of venereal disease clinics. Full-time position in a staff of fifty employees. Salary. \$5,400 to \$6,600 plus travel expense. Write C. R. Fargher, M.D., Director of Public Health, City Hall, Tacoma, Wash.

**Medical Social Worker**, Montgomery County, Maryland (adjacent to District of Columbia). Completion of approved medical-social work curriculum and one year paid, full-time experience under supervision in hospital or clinic of acceptable standards essential. Beginning, \$3,000 to \$3,600. Write V. L. Ellicott, M.D., Health Officer, Rockville, Md.

**Physicians, Male.** For school health service and medical care of low income families. Five days per week (40 hours). Salary \$347 monthly, plus automobile allowance \$30. Retirement features. Cincinnati Health Department, City Hall, Cincinnati 2, Ohio.

**Public Health Staff Nurse**, Hillsdale County Health Department, Southern Michigan. Well established health department with student field training program. Requirements: public health nursing certificate and college degree. Write to Dr. F. G. Moench, Director, County Health Department, Hillsdale, Mich.

#### POSITIONS WANTED

**Position as Director of Food Sanitation.** Well versed in Public Health control of food products, food, milk, and meat products. Graduate dairy technology, 12 years' practical experience dairy farming, operation of milk, butter, and ice cream plants, 21 years' public health enforcement of sanitary requirements pertaining to producer-dairy and pasteurization plants, food handling establishments and meat slaughtering, and processing. Past four years as director. Organizing and stabilizing food control program for large city. Age 47. State full particulars. Good references. Write Box L-529, Employment Service, A.P.H.A.

**Physician**, five years' experience as director of public school health system, four years in army, will receive M.P.H. from accredited midwestern university in June, 1947, seeks student health or child hygiene appointment, Southwest preferred. Write Box Q-1, Employment Service, A.P.H.A.

**Health Education Consultant**—Available on a temporary or contract basis for organization and development of projects in the field of public relations. Write Box H-532, Employment Service, A.P.H.A.

**Health Education.** Community Organization. Woman, M.S., A.B., R.N., experienced in community and college teaching, community organization, preparation of health education material and group work desires responsible position.

Experience includes work on local, state, and national level. Write Box H-534, Employment Service, A.P.H.A.

**Veterinarian** chiefly interested in food control (D.V.M. 1940, M.P.H. expected June, 1947); seeks position in field of food and drug administration or in food industry (laboratory or advisory). Experience: 2 years' animal disease control work (U. S. Dept. of Agriculture), 1 year meat inspection (Government), 4 years' food control and sanitation (U. S. Army Veterinary Corps). Write Box V-300, Employment Service, A.P.H.A.

**Milk Specialist** (plant, field or laboratory) interested in all phases of milk and food control, environmental sanitation, teaching. Degrees: D.V.M., M.S. (bacteriology and public health). Experience: administrative (acting director of meat and milk department, large city health department); food and drug inspector; research; private veterinary practice; live stock business. Publications mainly on brucellosis. Write Box L-527, Employment Service, A.P.H.A.

**Editorial or Research Position.** Broad experience in abstracting, translating. Four years as writer in state mental hygiene agency. Interested in preventive medicine, health education, mental hygiene, and general medical problems. Prefer East or West Coast. Write Box M-500, Employment Service, A.P.H.A.

**Sanitary Engineer, M.S.** (Sanitary Engineering), age 30, available July 1, for domestic position. Two years' experience includes sanitation director of a Michigan county health department plus training public health personnel. Veteran with overseas experience on public water supplies and sewage disposal for army camps and large European cities. Write Box M-507, Employment Service, A.P.H.A.

**Dentist:** 1942 graduate, Veteran, experienced in general and children's dentistry; postgraduate course in Full Denture Prosthesis and General Anesthesia, desires a position with a municipal, county, or state health department or

school system. Write Box A-2, Employment Service, A.P.H.A.

**Veterinarian:** Age 25 years; B.S., D.V.M., seeks field or laboratory position. Major interest investigation and/or control of animal diseases communicable to man. Experience, UNRRA Agricultural Rehabilitation, university Histology laboratory, city health department diagnostic laboratory. Write Box L-525, Employment Service, A.P.H.A.

**Engineer, M.S.** degree in sanitary engineering, veteran, age 28, desires position in Eastern United States; 5 years' experience in official agency; armed forces, and industry. Write Box E-510, Employment Service, A.P.H.A.

## Advertisement

# Opportunities Available

**WANTED—(a)** Physician trained and experienced in infant care to direct maternal and child health services, municipal department of health; newly created position unimpeded by politics; woman eligible; \$6,000 with provision for salary advancements to \$9,900; large city; Middle West. **(b)** Two physicians to join staff of student health department, liberal arts college; one position available in June, the other in September; apartments available in new building on campus provided physicians are War Veterans; \$7,000. **(c)** Medical officer; master's degree in public health and some experience, preferably in rural health programs; key position requiring administrative ability; \$7,200, Latin America. **(d)** Two men and, also, woman physician, to join staff of student health department; state university having enrollment of 18,000 (13,000 men); new student health building; professional staff comprised of seven internists, three psychiatrists, allergist, with other specialties represented on part-time basis; well equipped infirmary; complete x-ray and laboratory facilities; possibility teaching appointment. **(e)** Well trained and experienced public health officer to join staff of city health department; Pacific Coast; \$7,200. PHG-1 Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago 11.

**WANTED—(a)** Dentist for public health appointment; although public health desirable it is not required; woman eligible; duties principally with children with some emergency work in department of health, winter resort city; South. **(b)** Dentist to join staff, state department of health, Pacific Coast; graduate training or considerable experience in public health dentistry required. **(c)** Public health dentist for position with public schools; promising future, well equipped clinic; opportunity for developing private practice; Georgia. PHG-2 Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago 11.

**WANTED—(a)** Health educator qualified to serve as consultant to health educators on staff of state department of health: Ph.D., year of graduate training in public health with emphasis on education required; \$3,600-\$4,800. **(b)** Sanitary engineer; county department of health; staff includes three inspectors;

generalized program including supervision of milk control; \$3,300-\$4,200 including car and expenses; East. **(c)** Bacteriologist qualified for position of associate professor of bacteriology; duties include directing laboratories of city health department; \$4,000; Middle West. **(d)** Health educator; county tuberculosis association; thorough knowledge of tuberculosis required; town of 100,000, Middle West. **(e)** Sanitary engineer; degree in sanitary or public health engineering required; full-time teaching appointment; university school of public health; West. **(f)** Statistician to become associated with one of the national professional organizations; duties involve statistics on blood plasma program. **(g)** Milk sanitarian; municipal department of health; town of 45,000; South. **(h)** Bacteriologist; public health appointment; duties administrative including considerable research; \$3,300; New England. **(i)** Health educator; city health department; 170,000 population; newly created position; excellent opportunity to develop field; minimum, \$3,600. PHG-3 Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago 11.

**WANTED—(a)** Director of nurses and general supervisor; public health association; generalized program; considerable traveling; administrative experience required; salaries, \$4,149 per annum; Northeast. **(b)** Student health nurse; young women's college, enrollment of 700 students, well equipped infirmary, six weeks paid vacation annually; Pacific Coast. **(c)** Several staff nurses; well established health department offering generalized public health nursing service to approximately 200,000 people; urban and rural experience under supervision available; \$220 with adjustments based on experience; car provided; college town of 100,000; California. **(d)** Industrial nurse; accredited organization offering industrial program to small industries on coöperative basis; experienced industrial nurse, competent organizer required; \$200; Philadelphia area. **(e)** Student health nurse; liberal arts college, coeducational; preferably someone interested in working toward degree; salary dependent upon qualifications include complete maintenance, tuition; Pacific Northwest. **(f)** School nurse; private school conducted under American auspices in large city of

United States dependency; duties principally with boarding department which numbers 35 boys and 66 girls; salary dependent upon qualifications; beautiful campus. (g) Instructor and supervisor of outpatient nursing; teaching hospital; faculty rank; ample number of assistants; degree in public health preparation for generalized program required; West; minimum \$3,000. (h) Director, recently created nursing serv-

ice; experienced public health nurse with interest in pioneering required; salary dependent upon qualifications but not less than \$3,300; Middle West. (i) Health educator; city health department; 170,000 population; newly created position; excellent opportunity to develop field; minimum \$3,600. **PHG-4** Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago 11.

### Advertisement

## Opportunities Wanted

Physician well trained in public health and experienced in student health work; A.B., M.A., and M.D. degrees leading schools; graduate training in public health; several years' teaching experience; five years, director of student health service during military leave of permanent director; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Young dentist desires position involving some aspect of public health dentistry; institution; A.B. and D.D.S. degrees, midwestern universities; three years in the Navy, now in private practice; will go anywhere; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Bacteriologist; M.S., Ph.D. degrees, eastern university; six years' teaching experience; six years, bacteriologist, public health organization; has assisted in research and editorial work; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Health educator; M.S. degree in health education; doctor of education degree (major in School Health Education); eight years on staff, state university in department of health education; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Sanitary engineer; bachelor of science in civil engineering; master's degree in public health engineering; since 1940, sanitary engineer with county department of health and part-time teaching (public health) in university; seeks greater responsibilities; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Public health nurse; graduate of five year public health nursing course; B.S. degree; three years, general staff nurse, rural public health nursing program; scholarship to study health education; Master's degree in health education; eight years' important administrative experience in public health; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

## U. S. REGULAR ARMY CORPS RECRUITS FORMER OFFICERS AS CLINICAL PSYCHOLOGISTS AND PSYCHIATRIC SOCIAL WORKERS

Clinical psychologists and psychiatric social workers are needed in the U. S. Army. Former officers of the U. S. Army may now apply for commission in the Pharmacy Corps as technical specialists. College graduates with a degree acceptable to the Surgeon General which will basically qualify the officer for further training in clinical psychology and psychiatric social work respectively, will be acceptable for integration into the Pharmacy Corps. Minimum requirements for psychologists include civilian experience in abnormal or clinical psychological practice and a Master's degree in psychology (specialization in clinical, educational or industrial psychology). Minimum requirements for psychiatric social workers include at least one year's study in an accredited school of social work inclusive supervised field work plus one year's acceptable social case work experience.

Closing date for applications: July 31, 1947. For further information and application blanks write to Neuropsychiatry Consultants Division, Office of the Surgeon General, War Department, Washington 25, D. C.

## NEWS FROM THE FIELD

### UNIVERSITY COURSES IN HOSPITAL ADMINISTRATION

Announcement has recently been made of courses in hospital administration in three additional universities—University of Iowa, Washington University, and Yale University. The latter two are made possible by the collaboration of the W. K. Kellogg Foundation.

The University of Iowa program in hospital administration will be made up of two phases, an administrative internship and an administrative residency, each lasting from six to eighteen months. The program was begun on February 1, 1947. It will lead to a Master's or Doctor's degree in hospital administration.

The Washington University graduate course in St. Louis was established in September, 1946. It is a 21 month course made up of 9 months of academic instruction and 12 months of administrative internship in an approved hospital. The course is being given by the Department of Hospital Administration in the Division of Auxiliary Medical Services of the School of Medicine.

The Yale University program is announced for September, 1947, and will be given in the Department of Public Health of the School of Medicine. Its projected 21 months of training will be divided between academic residence at the university and administrative internship at a hospital. The program will lead to a Master's degree in hospital administration.

### DR. SOPER HEADS PAN AMERICAN SANITARY BUREAU

On February 1, Fred L. Soper, M.D., assumed the position of Director of the Pan American Sanitary Bureau, Washington, D. C. He succeeds Surgeon

General Hugh S. Cumming (Rtd.), U. S. Public Health Service, who becomes Director Emeritus after 26 years of service.

Dr. Soper has most recently been Associate Director of the International Health Division of the Rockefeller Foundation. He served for 10 years (1930–1940) as Director of the Yellow Fever Service of Brazil. Here he organized and administered mass eradication campaigns against *Aedes aegypti* so successfully that by the end of 1933 a number of the principal ports of Brazil were completely free of this carrier of yellow fever. The same methods were later applied to other South American countries.

In June, 1944, Dr. Soper organized the Gambiae Eradication Service in Egypt. Nine months later the gambiae mosquito, which had been causing the most serious epidemic of malaria recorded in Egyptian history, was eradicated. For his work in the eradication of tropical diseases he received a Lasker award at the 1946 annual meeting of the Association in Cleveland.

During the late war Dr. Soper was engaged in typhus and malaria control in the Mediterranean area with the U. S. Typhus Commission and the Allied Military Control, among other agencies.

### ADVANCED COURSE IN INDUSTRIAL HYGIENE NURSING AT COLUMBIA SCHOOL OF PUBLIC HEALTH

A new course in industrial nursing, leading to the M.S. degree in industrial hygiene, will be inaugurated in September, 1947, at the Columbia University School of Public Health (formerly DeLamar Institute) in New York. Applicants must be graduates of an ac-

credited school of nursing, have a baccalaureate degree, and must have had satisfactory experience in nursing.

The program includes industrial medical organization, occupational diseases and advanced industrial nursing practice, communicable diseases, health education, nutrition, public health practice, vital statistics, epidemiology, and field work in industry and community agencies. The course is one academic or one calendar year in length, depending on previous experience and preparation.

Senior Assistant Nurse Officer Emily M. Smith, U.S.P.H.S., will teach the industrial nursing courses. She has had experience in public health and industrial nursing and was most recently assigned to the Bureau of Industrial Hygiene of the Detroit City Department of Health.

This course for industrial nurses is a part of the generally expanded teaching program in industrial hygiene which has been established at the Columbia School of Public Health. Parallel curricula for physicians, engineers, and chemists are also being offered.

#### PROFESSOR WINSLOW HONORED AT YALE

On April 17, the 50th anniversary of Professor C.-E. A. Winslow's first publications, he was honored at a dinner at the New Haven (Conn.) Lawn Club by 150 faculty associates and graduates of the Yale Department of Public Health. Professor Winslow, who is an internationally known leader in public health, is Professor Emeritus of Public Health at Yale. He organized the Department of Public Health in 1915, serving as its chairman for 30 years until 1945.

Speakers at the dinner were, Dr. Hugh R. Leavell, Professor of Public Health Practices at Harvard, who represented the Yale Department's graduates; Dean Francis G. Blake of the Yale School of Medicine; Dr. George B. Darling, Director of Medical Affairs; and Dr. Mil-

ton Winternitz, Professor of Pathology.

Professor Winslow was presented with the first copy of the *March Yale Journal of Biology and Medicine* devoted entirely to 39 papers by his former students and colleagues, as well as a bibliography of 574 titles of articles, reports, and books written by Professor Winslow during the past 50 years. Among other contributors to this "Winslow" issue are the chiefs of the national health services of both the United States and Great Britain, Dr. Thomas Parran, Surgeon General of the U. S. Public Health Service, and Sir Wilson Jameson, Chief Medical Director of the British Ministry of Health.

Another highlight of the dinner was the announcement of a Lectureship Fund in honor of Professor Winslow. To be known as the Winslow Public Health Seminar Fund, this will provide for outstanding visiting lecturers and leaders of public health seminars. The fund is being raised through contributions of associates and former students.

#### NEW LIGHT ON ARTERIOSCLEROSIS

Experiments in Goldwater Memorial Hospital, the chronic disease hospital of New York City Department of Hospitals, have succeeded in producing arteriosclerosis in dogs, according to a recent report. The research, carried on by Alfred Steiner, M.D., and Forrest Kendall, M.D., was supported in part by the Albert and Mary Lasker Foundation. It is expected to produce significant results in the treatment of arteriosclerosis in man to which that produced in dogs by the experiment bears a striking resemblance. The experiments are to be reported in a forthcoming issue of the *Archives of Pathology*.

#### NUCLEAR RESEARCH FOR MEDICAL AND PUBLIC HEALTH WORK

Joint plans of the U. S. Bureau of Standards and the U. S. Public Health

Service for a 20 million dollar national radiation institution at Bethesda, Md., have been announced by Leon F. Curtiss, chief of the radioactivity section of the Bureau of Standards. The institute would concentrate on research in radioactivity, radiobiology, and nuclear energy in general for protection of health. It would include large laboratories and a uranium pile valued at 3 million dollars. The project has been recommended by the President's Atomic Energy Commission but will require approval of Congress before it can be undertaken.

#### AUSTEN RIGGS FOUNDATION

The Austen Riggs Foundation, Inc. of Stockbridge, Mass., announces the appointment of Robert P. Knight, M.D., as Medical Director to assume his duties on September 1, 1947. Dr. Knight is at present Chief of Staff of the Menninger Clinic at Topeka, Kan., where he has served in various capacities since 1933.

At the same time the Foundation announced the appointment of Edgerton McC. Howard, M.D., as Associate Medical Director. He has been serving as Acting Medical Director.

The Austen Riggs Foundation was founded in 1919 by the late Dr. Austen Fox Riggs for the treatment, study, and training in therapeutic procedures of the psychoneuroses.

#### FIELD TRAINING FELLOWSHIPS

For several years the W. K. Kellogg Foundation has encouraged field training of engineers by the formation of county training areas in Michigan. According to a recent announcement of the Michigan Department of Health, an agreement between the W. K. Kellogg Foundation and the Michigan State Department of Health places future administrative responsibility for these training programs with the State Department of Health.

Under the present arrangement undergraduates will be accepted for training periods up to three months in length. Graduates may be accepted for a period as long as twelve months. A stipend of \$100 per month is paid the undergraduate; \$125 per month is paid the graduate trainee.

To be eligible for a fellowship the undergraduate must be a candidate for a degree "in one of the branches of public health (public health or sanitary engineering, dairy science, food technology, bacteriology, etc.)" in a recognized professional school. He must have completed his junior year. Graduates must have received a degree in one of the specialties mentioned above. There is no implied obligation on the part of the trainee or the Michigan State Department of Health in the matter of employment following completion of the training periods.

Inquiries should be sent to the Michigan State Department of Health, Lansing 4, Mich.

#### NEW MEDICAL CENTER FOR EL PASO

Following a recommendation of the U. S. Public Health Service and the Texas Hospital Service, a medical center is under construction in El Paso, Tex. It will serve 10 counties in West Texas, as well as bordering counties in New Mexico and Arizona and the adjacent state of Chihuahua, Mexico. A group of citizens will serve as trustees of the Providence Memorial Hospital, a 2 million dollar general hospital and nurse training school and residence. It is expected that these facilities will raise the ratio of hospital beds in the area from 2.08 to 4.5 per thousand.

#### WEST VIRGINIA STRENGTHENS PERMISSIVE HEALTH UNIT

##### LAW

The West Virginia legislature, on February 6, passed House Bill 52 permitting cities and counties to merge

their health departments into one city-county unit serving the entire county. The state's earlier permissive legislation made no provision for consolidation of already existing full-time county and city health departments but gave a full-time county department jurisdiction over its contained municipalities with part-time health officers.

#### SUMMARY OF MILK-BORNE DISEASE OUTBREAKS—1923–1945

The Milk and Food Section of the Sanitary Engineering Division, U. S. Public Health Service, has prepared a Summary of Milk-borne Disease Outbreaks Reported by State and Local Health Authorities as Having Occurred in the United States During the Years 1923–1945; inclusive.

Included in the summary are figures on the number of outbreaks, cases, and deaths for typhoid, paratyphoid, scarlet fever and septic sore throat, diphtheria, dysentery, food poisoning and gastroenteritis, undulant fever and miscellaneous.

#### INDIANA LEGISLATURE INCREASES HEALTH APPROPRIATIONS

The 1947 Session of the Indiana State Legislature appropriated for the State Health Department \$750,000 and \$780,000 respectively for the two years of the biennium. This is double the appropriation for the year 1946. In addition the Legislature appropriated nearly two million dollars for a new state public health building, to be a unit of the University of Indiana Medical Center at Indianapolis.

The Legislature also passed laws authorizing county, city-county or multiple county health units. The present five state districts were also legalized, as was the Industrial Hygiene Division heretofore operating under an executive order. A bill to provide state financial assistance to local governmental units for the establishment and maintenance of full

time health departments was defeated however. It had the support of farm organizations and the state PTA Congress and will be reintroduced at the 1949 Session of the Indiana Legislature.

#### DR. MARTHA M. ELIOT TO SERVE INTERNATIONAL CHILDREN'S EMERGENCY FUND

It was announced on April 20 at United Nations headquarters, New York, that a survey of the relief programs now being carried out in several Central and Eastern European countries will be undertaken by the International Children's Emergency Fund, an agency of the United Nations. Dr. Martha M. Eliot, Associate Chief of the U. S. Children's Bureau, Washington, and President-Elect of the American Public Health Association, is now on leave from the Bureau as Chief Medical Consultant for the Fund.

It is expected that a group of four health and medical officers will spend several weeks touring children's institutions and inspecting other facilities. The survey will be under the direction of Dr. Ludwig Rajchman, Chairman of the Board which operates the Emergency Fund. It is expected that the Fund will help feed 20 million children, carrying out its own work through the national relief services which have been set up in each country.

#### NEW YORK ACADEMY MEDAL TO DR. MILLER

At its recent convocation meeting marking the end of the Centenary Celebration, the New York Academy of Medicine's Medal Award was presented to James Alexander Miller, M.D. In this citation, George Baehr, M.D., President of the Academy, referred to Dr. Miller's long activity in tuberculosis prevention, as an associate of Dr. Bigg's and Dr. Park, as president of the New York and the National Tuberculosis Associations, and as member of the



Committee on Public Health Relations for all of its 35 years, during 13 of them as Chairman.

At the convocation ceremonies also 21 distinguished physicians from various parts of the world were elected to honorary fellowship in the Academy. Two are Americans, Ernest William Goodpasture, M.D., Dean of the Vanderbilt University School of Medicine, and Alfred Newton Richards, M.D., Vice-Provost in charge of medical affairs of the University of Pennsylvania. The other 19 were: five from Great Britain, two from Sweden, and one each from Argentina, Belgium, Canada, Denmark, France, Germany, Great Britain, Holland, Ireland, Yugoslavia, Mexico, and Russia.

Among these are Sir William Wilson Jameson, Chief Medical Officer of the British Ministry of Health; Dr. Thorvald Madsen, former President of the Health Committee of the League of Nations; Dr. Manuel Martinez-Báez, Professor of the Medical School of the Nacional University of Mexico; Sir John Boyd Orr, Director-General of the United Nations Food and Agricultural Organization; Professor John Alfred Ryle, Head of the Institute of Social Medicine, Oxford University; Dr. René Sand, Professor of Social Medicine, University of Brussels; Dr. Henry Ernest Sigerist, former Director of The Johns Hopkins University Institute of Medicine and now in Switzerland continuing his studies in the history of medicine, and Dr. Andrija Stampar, Chairman of the Interim Commission of the World Health Organization.

Also elected to membership were 17 Corresponding Fellows from 10 countries. Included in this number Sir Alexander Fleming and Sir Howard Walter Florey, cowinners of the Nobel Prize for their work on penicillin, Dr. James MacAlister Mackintosh, Dean of the London School of Hygiene, Dr. Francisco deP. Miranda, Director of the Na-

tional Institute of Nutrition in the Mexican Ministry of Public Health and Assistance; and Dr. Jacques Victor Jules Parisot, Director of the Regional Institute of Hygiene at Nancy.

A number of awards were made at this meeting also; ten Bowen-Brooks scholarships of \$500 each given to young men returning from service for continued medical study. One Louis Livingston Seaman award of \$1,000 and three of \$500 each for aid in investigation in bacteriology or sanitary science were given respectively to James M. Neill, M.D., Cornell University Medical College, Arnold W. Pratt, M.D. of the same university, A. M. Poppenheimer, New York University College of Medicine and Samuel Prigal, M.D. The Edward N. Gibbs Memorial Prize of \$1,500 was awarded to Stanley E. Bradley, M.D., College of Physicians and Surgeons.

#### PROFESSOR IRVING FISHER OF YALE DIES

Irving Fisher, Ph.D., Professor Emeritus of Political Economy at Yale University and internationally known economist, died in New York on April 29 at the age of 80. Dr. Fisher joined the American Public Health Association in 1903, receiving the 40 year membership certificate in 1943. He was a Fellow of the Vital Statistics Section and a Life Member. He was well known for a sustained interest in the economic value of life and in life extension. In late years he gave untiring efforts to plans for the prevention of inflation, having appeared in Washington on this subject in February just preceding his 80th birthday.

#### PERSONALS

##### Central States

A. C. CURTIS, M.D.,<sup>†</sup> Director of the Division of Tuberculosis Control of the Arkansas State Health Department has resumed his duties after a

year's leave of absence during which time he has secured the Degree of Master of Public Health, in the Columbia University School of Public Health, New York, N. Y.

THOMAS D. FITZGERALD, M.D., M.S.P.H.,† formerly Physician in Health Service and Lecturer in Hygiene, University of Michigan, Ann Arbor, Mich., has been appointed Director of Health Service, Illinois State Normal University, Normal, Ill.

#### CHANGES IN ILLINOIS HEALTH OFFICERS:

L. L. VITT, M.D., has been appointed to the position of Health Officer of the Fulton County Health Department effective April 1.

DALE SCHOLZ, M.D.,† formerly Health Officer of the City of Middletown, Conn., has been appointed Health Officer of the Lawrence-Wabash County Health Department, effective June 1.

GEORGE H. AGATE, M.D., has been appointed as Health Officer of the Will County Health Department, Joliet, effective May 1, succeeding CECIL A. Z. SHARP, M.D.,\* who resigned effective April 1. Dr. Agate was formerly employed as Director of Maternal and Child Health Program in the Peoria, Ill., City Health Department.

STEWART C. THOMSON, M.D.,† has been appointed Assistant Professor, School of Public Health, University of Minnesota, Minneapolis, Minn. During the War Dr. Thomson was with the Office of the Surgeon General, Washington, D. C., as Chief of the Collection Branch and as liaison officer with G-2, W.D.G.S.

#### Eastern States

MATTIE J. BULLARD, M.D.,† formerly Major, UNRRA, New York, N. Y., has been appointed Director, Medical Department, Indiana Public Schools, Gary, Ind.

CLYDE K. CONRAD, M.D., has been appointed Deputy Administrator of Health Services of the North Atlantic Area of the American Red Cross. Dr. Conrad was associated with the Brewster Aeronautical Corporation as Medical Director before the war. During the war he was Flight Surgeon with the 12th Air Force and Base Surgeon of the Glider Base in Italy.

MATILDA E. DYKSTRA, formerly with the New York City branch of the Veterans Administration, where she was chief of the nursing division, has been transferred to the National Branch in Washington, D. C., as Deputy Director of the Nursing Service.

HERBERT R. EDWARDS, M.D.,† Director of the New York City Department of Health, Bureau of Tuberculosis, has been appointed to succeed FRANK KIERNAN\* as Executive Director of the New York Tuberculosis and Health Association upon the latter's retirement on September 1, 1947. Dr. Edwards is Assistant Professor of Public Health and Preventive Medicine at Cornell Medical School, Lecturer in Public Health Practice at Columbia University, Advisory Consultant to the Tuberculosis Control Division, U. S. Public Health Service.

CARL L. ERHARDT† has resigned as Assistant Registrar of Records of the New York City Department of Health to accept a position as Assistant Director of Vital Statistics of the State Health Department of Connecticut, State Office Building, Hartford.

GEORGE FAULKNER, JR., D.M.D., has joined the staff of Maine's Bureau of Health to operate the Bureau's Mobile Dental Unit serving areas where dental service is not otherwise available.

WILLIAM M. HAENZEL† became director of the Bureau of Vital Statistics, Connecticut State Department

of Health, on April 1. He succeeds WILLIAM C. WELLING who died last August. Mr. Haenzel had been associated with the New York State Department of Health since 1934.

ERNEST E. HUBER, M.D., has been appointed Senior Surgeon, Regular Corps, Active Duty, U. S. Public Health Service, New York, N. Y. Dr. Huber served until recently as Senior Surgeon, U.S.P.H.S. First Service Command, Boston, Mass.

RICHARD JONES, M.D., has resigned as Assistant Director of Health and Director of the Division of Venereal Disease Control in Maine, to reënter private practice. He will continue to direct venereal disease control work on a part-time basis.

DORIS LONGMAN and HARRIET STEVENS have been appointed to the staff of the Nutrition Service of the New York State Department of Health. Miss Longman has had nutrition teaching experience as well as field work with the Michigan and North Carolina State Health Departments; Miss Stevens recently completed five years with the Army Medical Corps as hospital dietitian.

DENNYS L. LYALL, PH.D.,\* formerly Assistant Director in Charge of Antitoxin, Serum, and Vaccine Laboratories, New York State Department of Health in Albany, recently accepted the position of Health Inspector with the City Health Department of Salisbury Municipality, Southern Rhodesia, Africa.

SIBYL MANDELL, M.D., was recently appointed chief of the newly established Division of Mental Hygiene in the Bureau of Child Hygiene of Baltimore City Health Department. Dr. Mandell was most recently on the staff of the Bureau of Maternal and

Child Health of the New Jersey State Health Department.

ROSCOE L. MITCHELL, M.D.,† retired on April 30 as Director of the Bureau of Health of the Maine State Department of Health and Welfare. He has reëntered private practice which he left to join the State staff in 1930. He has been succeeded by DEAN FISHER, M.D., one of the state's district health officers, who was also a state district engineer before he studied medicine.

M. VIRGINIA PARSONS, R.N.,† formerly with the Program Development, National Tuberculosis Association, New York, N. Y., has been appointed Executive Secretary of the New Haven, Conn., Tuberculosis and Health Association.

ALEX J. STEIGMAN, M.D.,† will resign from the Department of Pediatrics of Temple University Medical School, Philadelphia, Pa., to serve as Senior Fellow in Pediatrics of the National Research Council. He will work at the Children's Hospital Research Foundation, Cincinnati, Ohio, under ALBERT B. SABIN, M.D., commencing June 1, 1947.

LEON S. STONE, PH.D., Bronson professor of comparative anatomy, Yale University School of Medicine, New Haven, Conn., will receive the Robert W. Doyne Memorial Medal, an annual award of the Oxford Ophthalmological Congress in England. Dr. Stone who will go to England next summer to address the congress at Keble College, Oxford, was given the award in recognition of his work on retinal regeneration and vision experiments in transplanted eyes.

#### Southern States

ARTHUR G. BAKER, M.D.,† formerly Director, Johnson-Magoffin County Health Department, Paintsville, Ky., has been appointed Director, Allegan County Health Dept., Allegan, Mich.

\* Fellow, A.P.H.A.  
† Member, A.P.H.A.

JAMES R. COPELAND,† formerly Bacteriologist in Charge, Elkton Branch Laboratory, Maryland State Department of Health, has been appointed Bacteriologist in the Veterans Administration, Legion, Tex.

GLENN J. HAWKINS† until recently Sanitary Technician with the Army Air Forces has been appointed Public Health Engineer, Sanitary Engineering Division, State Department of Public Health, Richmond, Va.

MARGUERITE L. HAYS, R.N.,† formerly Director, Health Council, Council of Social Agencies, Dallas, Tex., has been appointed Executive Secretary of the newly organized Dallas Health Museum.

RALPH H. HEEREN, M.D.,\* has been appointed head of the epidemiology section of the Oklahoma State Health Department. He has been director of the Hutchinson Memorial Clinic, Tulane University School of Medicine, New Orleans, La.

N. V. HENDRICKS, JR., has been appointed Industrial Hygienist on the executive staff of the Standard Oil Company of New Jersey beginning April 15. Just before accepting this position he was unanimously elected the first honorary life member of the Georgia Society of Professional Engineers. He has been in the Division of Industrial Hygiene of the Georgia Department of Public Health, most recently as Assistant Director.

JOE G. HUFSTEDLER, M.D., M.P.H.,† formerly Director, Knox County Health Unit, Tenn., has been appointed Resident in Pediatrics, Methodist Hospital, Memphis, Tenn.

JOHN M. McDONALD, M.D., D.P.H.,\* has been appointed Director of the Division of Industrial Hygiene, Florida State Board of Health, beginning February 1. For the past ten years

Dr. McDonald was Director of the Bureau of Occupational Diseases in the Baltimore, Md. City Health Department.

DONALD B. McMULLEN, M.D.,† associate professor of Preventive Medicine and Public Health, University of Oklahoma School of Medicine, has been granted a 2 year leave of absence to become Senior Parasitologist with the 406th Medical General Laboratory, U.S.A., in Tokyo. During the War Dr. McMullen was a member of the Commission on Schistosomiasis, Army Epidemiological Board, receiving a Medal of Freedom for his work in the Philippines and Japan.

GEORGE A. NEVITT, D.D.S., M.S.P.H.,\* formerly Dental Consultant to UNRRA in Washington, D. C., has been appointed Senior Dental Surgeon, U.S.P.H.S., District 2 with headquarters in Richmond 19, Va.

RUSSELL C. NYE, M.B.A.,† formerly Administrator Parkland Hospital, Dallas, Tex., has been appointed Executive Administrator, Northwestern Hospital, Minneapolis, Minn.

#### Western States

CAROLYN DITTON, formerly Orthopedic Advisory Nurse with the Washington State Health Department, has been appointed Head Orthopedic Nurse at the Mt. Edgecumbe Orthopedic Hospital at Sitka, Alaska. It is the only orthopedic hospital in Alaska and is a coöperative project of the Territorial Department of Health and the Alaska Native Service.

HORACE J. DODGE, M.D., M.P.H.,† formerly Director of the Kootenai County Health Unit, Idaho, has been appointed Assistant Professor of Public Health, University of Colorado School of Medicine, Denver, Colo.

HAROLD M. ERICKSON, M.D.,\* Oregon State Health Officer, has been appointed Assistant Professor of Public Health and Preventive Medicine, The

\* Fellow, A.P.H.A.

† Member, A.P.H.A.

University of Oregon Medical School. He will give occasional lectures at the Medical School in Portland, Ore.

JEANNETTE (SNYDER) HILLER, R.N.,† who served until recently with the UNRRA Mission in Greece is now Divisional Supervising Nurse in the Production and Marketing Division, Labor Branch of the U. S. Department of Agriculture with headquarters in Portland, Ore.

FRED R. INGRAM, M.S.,\* has been appointed Senior Industrial Hygiene Engineer, Bureau of Adult Health, State Department of Public Health, Berkeley, Calif. Mr. Ingram was formerly Chief, Division of Industrial Hygiene, University of Colorado, Denver, Colo.

HARRY S. STAHR, M.D.,† has been appointed Assistant Surgeon, Captain of the Veterans Home of California, Napa County, Calif. Dr. Stahr was formerly School Physician, Los Angeles Public Schools, Calif.

MAURICE D. VEST, M.D.,† has been appointed as Director, Maternal and Child Health Section, Oregon State Board of Health. He was formerly Director of the Division of Crippled Children in the Colorado State Health Department.

ALFRED T. WILLIAMS, C.P.H.M.,† most recently Assistant Sanitation Officer and Rodent Control Officer of the U. S. Naval Operating Base in the Midway Islands, has been appointed Chief Sanitary Inspector, U. S. Naval Station, Division of Sanitation, San Diego, Calif.

### Foreign

ARTHUR STOLL, M.D., Basle, Switzerland, internationally known authority in pharmaceutical chemistry, has been honored with the publication of a special anniversary issue of the *Swiss Medical Journal*.

### Deaths

RAY G. HULBURT, Editor of the *Journal of the American Osteopathic Association*, died on April 15 after a 4 months' illness.

WILLIAM M. MCKAY, M.D.,† State Health Commissioner of the Utah State Department of Health, Salt Lake City, died April 13. Dr. McKay had served for several years, during which time the department had been greatly strengthened. He cooperated in the building of the Utah Public Health Association into a state professional society of vigor and influence.

DWIGHT M. WARNER, Lecturer in Social Hygiene for the Wisconsin State Board of Health, died March 24 in an automobile accident.

### CONFERENCES AND DATES

American College of Hospital Administrators: Third New England Institute for Hospital Administrators, Brown University, Providence, R. I. June 19-28.

Maritime Institute in Hospital Administration. St. John, New Brunswick, Canada. June.

Third Western Institute for Hospital Administrators. Stanford University, Palo Alto, Calif. August.

Fifteenth Chicago Institute for Hospital Administrators. University of Chicago, Chicago, Ill. September 2-12.

Annual ACHA Convocation and General Assembly of Membership. St. Louis, Mo. September 21-22.

American Congress of Physical Medicine. 25th Annual Scientific and Clinical Session. Hotel Radisson, Minneapolis, Minn. September 2-6.

American Dental Association. Annual Meeting. Boston, Mass. August 4-8.

American Dietetic Association. Philadelphia, Pa. October 13-17.

American Heart Association. Annual Meeting. Hotel President, Atlantic City, N. J. June 6-8.

American Hospital Association. Annual Convention. St. Louis, Mo. September 22-25.

American Public Health Association—75th Annual Meeting. Atlantic City, N. J. October 6-10.

\* Fellow, A.P.H.A.

† Member, A.P.H.A.

# American Journal of Public Health

## and THE NATION'S HEALTH

---

Volume 37

July, 1947

Number 7

## Mouse Protection Tests in the Study of Pertussis Vaccine:

A Comparative Series Using the Intracerebral Route for Challenge \*

P. L. KENDRICK, Sc.D., F.A.P.H.A., GRACE ELDERING, Sc.D.,  
F.A.P.H.A., M. K. DIXON, AND J. MISNER

*Bureau of Laboratories, Michigan Department of Health, Western Michigan  
Division, Grand Rapids, Mich.*

IN early 1943, in connection with an investigation of the antigenicity of pertussis vaccines, particularly as measured by animal protection, a coöperative study was undertaken with a group of interested manufacturing laboratories. As a starting point, samples of vaccine were submitted for comparative density determinations. The findings indicated that a photometric method was reasonably reliable and reproducible, under properly controlled conditions. For example, the calibration chart for each particular instrument should be based on a series of graded dilutions of a suspension of organisms having the size and morphology of smooth *Hemophilus pertussis*; the suspension must be of known density based on a series of di-

rect counts; and it should be practically free from color and extraneous matter. An unknown suspension to be standardized as to density also must meet certain requirements. It is clear that a suspension in which the organisms are large and pleomorphic, or one highly colored or containing extraneous matter could not be read correctly in terms of the calibration chart. With these conditions in mind, in the comparative protection tests which were planned, we chose the photometric procedure for measuring the bacterial suspension for the immunizing and challenging doses.

Preliminary experience with pertussis mouse protection tests, using the intracerebral route for challenge was reported to the Subcommittee on the Evaluation of Administrative Practices,<sup>1</sup> and discussed at the Biologic Section of the American Drug Manufacturers Association in October, 1944. As stated in that report, the need for a test of the potency of pertussis vaccine had long been recognized. During sev-

\* Presented before the Laboratory Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 13, 1946.

Sponsored by the Subcommittee on the Evaluation of Administrative Practices of the A.P.H.A., with the aid of funds granted by laboratories in the Biologic Section of the American Drug Manufacturers Association.

eral years in experiments with approximately 12,000 mice we had accumulated data on protection tests in which the mice were infected with mucin-suspended organisms by the intraabdominal route. Protection could be demonstrated by that method and the results were sufficiently encouraging to stimulate investigation. Such a procedure has been used with some success by other workers, notably Holm and Bunney.<sup>2</sup> However, after many trials of various combinations of dosage, interval, and challenge, we were unable to standardize the procedure with reference to a satisfactory potency test. The question of route of infection was therefore given further consideration.

Based on relatively limited trial it appeared that the intranasal method of infection, although suitable for certain investigative work, did not answer the need for a potency test. The experience of Norton and Dingle<sup>3</sup> with the intracerebral route of infection in mouse protection tests in typhoid led us to try that route in pertussis. Norton<sup>4</sup> also reported to us his results in some preliminary pertussis protection tests, which stimulated us to investigate this method further. Concurrently, work along similar lines has been in progress at the National Institute of Health, under the direction of Margaret Pittman.<sup>5</sup>

In the first comparative tests,<sup>1</sup> varying degrees of protection were demonstrated with twelve different samples of vaccine submitted by the coöperating laboratories. The results were so encouraging that plans were immediately outlined for study of the factors involved in the development of a practical test, and for carrying out at the earliest possible date some comparative tests among the interested laboratories. These tests performed by different workers in their own laboratories would test the reproducibility of results and point the way to improvements in technique.

#### METHODS

Each laboratory was to test a reference antigen in comparison with an antigen of its own choice, according to a common procedure as outlined. Materials were furnished as follows: (a) mimeographed outline of procedure; (b) a challenge culture of *H. pertussis*, No. 18-323, which had been found to have an LD/50 in the range 200 to 500; and the challenge dose specified to be 40,000; (c) a reference antigen prepared from single culture 10-536 L<sub>1</sub>, to be used for checking the photometric standardization of dosage in the different laboratories, as well as for immunization of mice in the tests; and (d) forms and sample protocol, with the method of Reed and Muench<sup>6</sup> specified for determining the 50 per cent end points of the lethal and immunizing doses.

*Course of disease in intracerebrally infected non-immunized mice*—Intracerebral infection of mice with *H. pertussis* has proved particularly suitable for use in protection tests because of the clear-cut incubation period, and the orderly progress of symptoms in a typical clinical syndrome which ends in death. Following intracerebral injection under anesthesia with an infective dose of *H. pertussis*, the non-immunized mouse shows a series of typical symptoms. After recovery from the anesthetic, the mouse usually appears normal for a number of days. This incubation period varies with the animal and with the dose. For example, following a dose of 20,000 organisms of a highly virulent culture, it is usually 4 to 5 days before the first symptoms of illness; with a larger dose the symptoms may appear earlier, and with a smaller dose, later. Most deaths occur within 2 weeks after infection.

At first the mouse becomes inactive and the coat appears ruffled. The animal is irritable and sits in a hunched position, with the head lowered and appearing to be bulged. Following these

first indications of illness, there is a progressive loss of muscular control, and avoidance of food. During the next 48 hours, the mouse becomes prostrated and shows convulsive motions, breathing becomes labored and death usually follows after a few hours. Death seldom occurs without these typical signs of encephalitis. *H. pertussis* can be isolated from the brain, and multiplication of the organisms in the brain is easily demonstrated. Histological examination reveals brain abscess and encephalitis. There is infiltration of the choroid plexus and ependyma with wandering and polymorphonuclear cells.\*

*Certain technical factors in the development of a procedure*—Selection of a challenge culture with a small killing dose was of prime importance. From preliminary experiments with the intracerebral route of infection it was observed that smooth cultures of *H. pertussis* varied greatly in lethal dose. Cultures which had similar growth characteristics and agglutinability, and which gave comparable protection in mice when used as immunizing antigens, were found to vary in LD/50 from 200 organisms to several million. Fortunately, culture No. 18-323, one of the most virulent yet found, was among the first to be tested, and it was chosen for use in the comparative tests. Storage in the dried state has been found to maintain the culture's virulence, according to our present experience.

In the first experiments salt solution was used for suspending the organisms for brain inoculation, but viability tests by means of colony counts showed that the pertussis bacilli died so rapidly that the first and last mice injected in an experiment received very different numbers of living organisms. Cultures suspended in a 1 per cent solution of Casa-

mino acids (Technical Difco) in distilled water, were found to remain viable for several hours, a period more than satisfying the conditions of the test. The Casamino acid solution was considered especially satisfactory because it was easily reproducible and it was accepted for routine use pending further study.

Standardization of the suspension for the challenge dose was recognized as a prerequisite to reproducibility of results. In order to obtain consistent LD/50 results in different experiments the utmost care must be used in controlling those factors which are known to influence the results. For example, uniform conditions of the challenge culture should be maintained, including medium, incubation time, and temperature; there should be careful standardization of the photometer; precise technique in dilution of the suspension, such as the use of a separate pipette for each dilution; and the diluted suspension should be injected into the mice within a short time after preparation to insure viability.

The question of immunization dosage in relation to challenge required considerable preliminary work. In the first tests, a constant immunizing dose and graded challenge doses were tried, but frequently sharp end points were not obtained. In experiments in which the challenge dose varied from 100 to 10,000 times the LD/50 it was found that in the higher ranges even a 10-fold increase had little effect on the end point. A graded immunization schedule with a constant challenge dose proved far more sensitive, and in the proper range resulted in reproducible end points.

*Condensed outline of procedure chosen for the comparative test—*

*Mice*—White Swiss mice, 12 to 14 gm., all one sex or sexes equally distributed, were caged in groups of 15 each. Three groups were used for each

\* Histological examinations were made by H. E. Cope, Pathologist, Michigan Department of Health Laboratories.



TABLE 1

*Pertussis Mouse Protection Test; Results Obtained by One Laboratory (No. 7)**Immunization:* Injections 2; Route intraabdominal; Interval 5 days

Wt. of mice 13-16 gm.; Rest period 10 days

*Challenge:* Culture 18-323 L<sub>S</sub>; Suspended in 1% Casamino acids; Intracerebral route  
Challenge dose: 40,000 = 250 × LD/50 of 160

Antigen	Im. Dose	Results										Estimation of End Point		
		Mice Challenged		Summary at 14 Days				Total				Add		
				Day of Death	D	S	D	S	Total	S/T %	Dis- tance %	Im D/50	S/T %	Dis- tance %
	Billion	Weight	Number											
C 224	0.08	18-24	15	4.4.5.5.5.5.8.11	8	7	12	7	19	37%	0.29	0.13		
	0.4		(15)14	4.4.(6M).9.	3	11	4	18	22	82				
	2.0		15	6	1	14	1	32	33	97				
Ref. 10-536	0.08	18-24	(15)14	(1).4.5.6.6.9.10.										
				14.	7	7	8	7	15	47%	0.06	0.09		
	0.4		15	11.	1	14	1	21	22	96				
	2.0		15		0	15	0	56	56	100				Ref.=1
Controls: Number of organisms														
80		18-24	15	8.8.8.8.14	5	10	5	14	19	26%	0.44			
400			15	6.8.8.8.8.10.10.	11	4	16	4	20	80				
				10.10.12.12.										
2,000			(15)14	5.5.5.5.5.(6M)6.6.										LD/50
				6.6.6.7.8.8.8.	14	0	30	0	30	100				160

Note: A parenthesis indicates that the mouse is subtracted from the total and does not enter into the calculations. For example, deaths during the first two days are considered due to injury; M indicates a missing animal.

Colony count on Bordet-Gengou plate: An inoculum of 0.1 ml. of 2,000/ml., that is 200 organisms by photometer, resulted in 79 colonies; an inoculum of 400, in 148 colonies.

Definitions: See note 7 under Table 2.

TABLE 2

*Summary: End Points Obtained in 14 Tests by 10 Laboratories*

Laboratory	LD/50 of Culture 18-323	Ratio: Challenge Dose to LD/50	Im D/50 Values		Ratio: Test Vaccine to Reference Vaccine
			Test Vaccine	Reference Vaccine 10-536	
1	320	120	0.26	<0.08	>3.0
2	480	80	(a)0.19	0.11	1.7
			(b)0.32		2.9
3	360	110	(a)<0.08	0.14	<1.0
			(b)0.16		1.1
4	400	100	0.12	<0.08	>1.0
5	1,870	20	0.09	<0.08	>1.0
6A	250	160	>2.0	1.03	>1.0
6B	220	180	(a)>2.0	0.78	>2.0
			(b)0.67		0.9
7	160	250	0.13	0.09	1.4
8	200	100	0.17	<0.08	>2.0
9A	600	70	<0.08	<0.08	?
9B	730	50	0.14	<0.08	>1.0
9C	170	230	0.24	0.08	3.0
10-1	470	80	0.21	0.12	1.8
10-2	80	500	0.45	0.40	1.1

- Notes: 1. The LD/50 (number of organisms) is rounded to nearest 10.  
 2. Figures for ImD/50 (in billions) are rounded to two decimal places, for purposes of comparison.  
 3. Test vaccine refers to the one selected by each laboratory.  
 4. Laboratory 6: The test antigen (a) was the same antigen in experiments A and B.  
 5. Laboratory 9: The three test antigens in the three tests A, B, and C bore different numbers.  
 6. Laboratory 10: The culture suspensions were standardized differently in the two tests.  
 7. Definitions: LD/50 is the number of organisms which kills 50 per cent of a group of mice; ImD/50 is the total immunizing dose (in billions) which protects 50 per cent of a group of mice against the challenge culture dose; 50 per cent endpoints computed by Reed Muench method.

antigen tested and four groups for controls.

*Immunization*—From a stock suspension of 10 billion per ml. based on photometer readings, dilutions were made in saline as required. The total doses for the 3 groups of mice for each antigen were respectively, 0.08 bil., 0.4 bil. and 2.0 bil., each total amount divided in two 0.2 ml. doses injected intraabdominally, with a 5 day interval between injections. Injected mice and controls were allowed to rest for 10 days. (We are now using a single injection, and a graded dosage schedule designed to bring the ImD/50 relatively close to the middle of the three doses, such as 0.06, 0.3, and 1.5 bil.)

*Preparation of challenge suspension*—The dried culture No. 18-323 was revived on Bordet-Gengou medium, a second subculture grown for 48 hours and subculture No. 3, 4, 5, or 6 used for injection after a 24 to 30 hr. incubation period. The growth was harvested into a 1 per cent solution of Casamino acids (Technical Difco), adjusted to pH 7.0-7.2; checked for purity and morphology by Gram stain; and standardized to 5 bil./ml. based on photometer readings. Dilutions were made in Casamino acid solution for injection of the challenge culture in doses of 80, 400, 2,000, and 40,000 organisms, respectively, each dose in 0.04 ml. volume for the mice in the control groups; and 40,000 for all the immunized mice. Viability of the organisms was checked by colony counts, which are usually from one-fourth to one-half the number of organisms indicated by photometer readings.

*Intracerebral injection* — The mice were injected under anesthesia (2 parts ether and 1 part chloroform) within 2 hours of dilution of the culture suspension. A  $\frac{1}{4}$  ml. syringe with  $\frac{3}{8}$  in. 27 gauge needle was used and the needle inserted slightly to one-side of the midline and just in front of the "hump."

*Observation period*—The mice were observed daily for 14 days and the number of deaths was recorded. (In the summary at the end of the 14th day, prostrated mice may be included as deaths.)

#### RESULTS OF COMPARATIVE TESTS

The form in which the results were submitted is illustrated in the protocol for Laboratory No. 7, Grand Rapids (see Table 1).

From similar protocols submitted by all the laboratories, a summary of end points has been made in Table 2.

*The LD/50 results obtained by the ten laboratories*—Considerable difficulty could be anticipated in reproducing the LD/50 of the challenge culture in different laboratories. The virulence could vary according to growth conditions because of unknown factors; there could be variation in the number of organisms injected due to technical factors related to standardization and preparation of the challenge suspension; there is possibility of variation in mouse strains; and technical factors related to injections into the mouse brain, such as variation in the injection site or loss of part of the inoculum by oozing after use of a needle with a rough point, could influence the result.

Actually the consistency of the LD/50 results is most encouraging. If the LD/50 end points in the summary are arranged in order, it is found that the middle half are between 200 and 480; 10 of the 14 lie between 160 and 480, with a mean of 310 and a median of 360. While this is gratifying, it is very important that every effort be made to explain the extreme results. It should be mentioned that two laboratories that did not submit protocols for inclusion in the summary, reported later that they had obtained unsatisfactory LD/50 results.

As shown in the summary of end points in Table 2, the challenge dose of

TABLE 3  
Expression of LD/50 and Challenge Dose by Photometer Density

Lab. No.	Plate Count		Ratio: Column 1 to Column 2	LD/50		Challenge Dose		Ratio: Challenge Dose to LD/50
	Number of Organisms Planted (Photometer) (1)	Number of Colonies (2)		By Photometer	By Colony Count	By Photometer	By Colony Count	
1	None	...	...	320	...	40,000	.....	120
2	400	101	4.0	480	120	40,000	10,000	80
3	400	158	2.5	360	140	40,000	16,000	110
4	None	...	...	400	...	40,000	.....	100
5	400	67	6.0	1,870	310	40,000	6,660	20
6A	160	150	1.1	250	230	40,000	36,360	160
6B	160	65	2.5	220	90	40,000	16,000	180
7	400	148	2.7	160	60	40,000	15,000	250
8	400	161	2.5	200	80	20,000	8,000	100
9A	400	95	4.2	600	140	40,000	9,520	70
9B	400	100	4.0	730	180	40,000	10,000	50
9C	None	...	...	170	...	40,000	.....	230
10-1	400	76	5.3	470	85	40,000	7,550	90
10-2	None	...	...	80	...	40,000	.....	500

Note: For the sake of comparison, the colony counts are tabulated for a plate inoculum of 400 organisms by photometer readings; if the 400 inoculum was not used by a particular laboratory the next lower figure was selected.

40,000 as used by the ten laboratories varied from 20 to 500 times the LD/50, but the majority were in the range 100 to 250. Since the dose was determined on the basis of density, the question arose as to the viability of the organisms injected. In Table 3 the LD/50 and challenge dose in ten tests are given, based upon photometer readings and also upon colony counts.

In the majority of these tests, the ratio of the number of organisms planted (based on photometer) to number of colonies varied from 2.5 to 4.2. With regard to the colony counts it should be remembered that *H. pertussis* frequently occurs in pairs, so that colonies could be expected to be fewer than the actual number of organisms. Clumping would also result in fewer colonies. Poor growth conditions for single colonies (for instance medium containing peptone) might account for further reduction in the number of colonies. Referring to the table, it is evident that whether LD/50 and challenge doses are expressed in terms of photometer or colony counts, the ratio remains the same. In expressing the results of the

test it is probably simpler to use the photometric density, using colony counts only as a consistency check.

*ImD/50 results with the reference vaccine*—It is obvious, from the indeterminate end points of the reference vaccine in six of the tests, that the vaccine dosage schedule as chosen was in too high a range for this antigen. With a properly balanced test the 50 per cent end point should be fairly close to the middle of the dosage range. Based on inspection of the results, the ImD/50 of the reference vaccine, under conditions of the test, is of the order 0.1 billion. The similarity of the results obtained by most of the laboratories was gratifying. The one end point farthest out of line was 1.03 billion, obtained by laboratory 6 A. This laboratory subsequently accounted for the high result on the basis of the particular mouse strain used.

*ImD/50 results with the various test vaccines*—Of the 17 test vaccines only one gave an ImD/50 value less than the reference vaccine. However, several gave results which were very close and only a few had end points which could

be considered significantly higher. In the interpretation of the end points obtained with these test vaccines, it is recognized that more experience is required before the significant limits of variation can be determined or the results defined in terms of potency.

The need for an antigen of reference is emphasized by the results of the comparative tests, as listed in Table 2. For example, test vaccine No. 1 has an ImD/50 value considerably less than vaccine 6 B(b). However, vaccine 1 has an ImD/50 value approximately three times that of the reference antigen, while vaccine 6 B(b) has a value which is nearly the same as that of the reference vaccine. The evaluation of an antigen in relation to a standard of known strength would appear to be more reliable than the actual ImD/50, since the latter does not allow for the technical variations which are bound to occur in different experiments. Also, a reference vaccine would avoid false conclusions in the instance of the use of a strain of mice that required a smaller or larger immunizing dose than the mice ordinarily used.

*Analysis of results*—While the Reed Muench method was used for calculating the 50 per cent end points, the data have been examined also by the method of Bliss<sup>8</sup> modified by Litchfield and Fertig.<sup>9</sup> The results would not add materially to the present report but they do lend support to the validity of the test.

#### GENERAL COMMENTS

In much of the discussion during the years on problems of pertussis vaccines, a base line for comparison has been lacking. While tests for agglutinins, opsonins, and complement-fixing antibodies have been used for what information they would give, workers have felt the need of a suitable animal protection test. Results of the comparative series presented here suggest that the intra-

cerebral mouse test offers promise as the basis for a potency test by which the antigenicity of pertussis vaccine can be judged. A tentative outline on similar lines was sent recently by the National Institute of Health to manufacturing laboratories in connection with the development of minimum requirements for pertussis vaccines.<sup>5</sup> Another application is the study of different methods of preparing vaccine, illustrated by the recent paper by Cohen and Wheeler<sup>7</sup> on pertussis vaccine prepared in fluid medium. Also when the technical details have been worked out for applying the procedure to passive tests, a tool may be available for studying such a fundamental problem as pertussis vaccine dosage in terms of the mouse protective properties of the serum of immunized children; and for evaluating therapeutic antisera. Perhaps most important of all is the use of the test in the selection of highly antigenic cultures for vaccine production.

In connection with the choice of a particular technical procedure for the intracerebral mouse test, further work and more experience are required. It needs to be remembered that there may be considerable variation in technique depending on the purpose of the test. For example, in a potency test which is to be the basis for acceptance or rejection of a vaccine, a dosage range for immunization will be chosen which is suitable for the vaccine of reference. If, on the other hand, there is to be a quantitative comparison of antigens, there may need to be a preliminary test to find the range. In passive tests with serum of relatively low antibody content, it is probable that care must be taken to use a relatively smaller challenge dose than the large ones that can be used in active tests.

#### SUMMARY

Mouse protection tests, using the intracerebral route for challenge, were

used in a series of comparative tests by ten laboratories.

The comparative results with the procedure as outlined demonstrated a good degree of reproducibility in the hands of different workers, and the method detected differences in vaccines in relation to a reference antigen.

Certain technical factors are discussed, particularly the interrelationship of the different parts of the procedure and the need for a reference antigen.

A mouse protection test such as used in this study is suitable as the basis for a pertussis vaccine potency test; it is applicable to the choice of cultures for vaccine production; and it is a promising method for investigation of fundamental problems in pertussis.

**ACKNOWLEDGMENT:** The authors are grateful to E. S. Weiss, Tuberculosis Control Division, U. S. Public Health Service, for his statistical treatment of the data; they acknowledge their good fortune in the interest of J. Ipsen, Chief of Biological Stand-

ards, State Serum Institute, Copenhagen, who studied the data and carried out certain statistical analyses; and thanks are due L. Portwood, Biological Products Division, Michigan Department of Health, for preparation of the reference antigen.

#### REFERENCES

1. Kendrick, P., and Eldering, G., with the technical assistance of Misner, J., Dixon, M., and Thompson, M. Report to Subcommittee on Evaluation of Administrative Practices of the A.P.H.A. October, 1944. (Unpublished.)
2. Holm, A., and Bunney, W. E. Potency-determination of Antipertussis Serum by the Mouse-protective Test. *J. Immunol.*, 44:33-38 (May), 1942.
3. Norton, J. F., and Dingle, J. H. Virulence Tests for Typhoid Bacilli and Antibody Relationships in Antityphoid Sera. *A.J.P.H.*, 25:609-617 (May), 1935.
4. Norton, J. F. Personal communication.
5. Pittman, M. Personal communication; and "A Tentative Mouse Protection Test for Determining the Antigenicity of Pertussis Vaccine," outline sent to manufacturing laboratories by the National Institute of Health, January 5, 1946.
6. Reed, L. J., and Muench, H. A Simple Method of Estimating Fifty Per cent Endpoints. *Am. J. Hyg.*, 27:493-497 (May), 1938.
7. Cohen, S. M., and Wheeler, M. W. Pertussis Vaccine Prepared with Phase I Cultures Grown in Fluid Medium. *A.J.P.H.*, 36:371-376 (Apr.), 1946.
8. Bliss, C. I. Calculation of the Dosage-mortality Curve. *Ann. Applied. Biol.*, 22:134-164, 1935.
9. Litchfield, J. T., Jr., and Fertig, J. W. On a Graphical Solution of the Dosage-effect Curve. *Bull. Johns Hopkins Hosp.*, 69 (3):276-286 (Sept.), 1941.

## American Museum of Health

The American Museum of Health is working on plans for the revitalization of the Museum, where they were temporarily terminated at the beginning of World War II.

The Museum is very anxious to obtain several copies of the book *Your Health*, which served as a guide to the exhibit during the second year of the World's Fair in 1940. Its supply of this publication was depleted by water

damage, while in storage. If you have a copy, the Museum would greatly appreciate your mailing it to its Secretary, Homer N. Calver, Room 806, 1790 Broadway, New York, N. Y.

The Museum does have a supply of *Man and His Health*, which served as a guide for 1939. If you are interested they would be very pleased to send you a copy of this book in exchange for your copy of *Your Health*.

# Wartime Army Medical Laboratory Activities

The Wartime Army Medical Laboratory Organization \*

GUSTAVE J. DAMMIN, M.D.

*Assistant Professor of Medicine and Pathology, Washington University School of Medicine; Director of Laboratories, Barnes Hospital, St. Louis, Mo.; Formerly, Director, Laboratories Division, Preventive Medicine Service, Office of the Surgeon General*

IT was indeed a pleasure to be invited to give an account of the wartime organization and activities of the Army's Medical Laboratories. Particularly to those who were in a position to observe and be part of the activities in the Surgeon General's Office, the Army Institute of Pathology and the Army Medical School, as well as in laboratories in the Zone of the Interior and overseas, it is a record of achievement that can be related with a sense of pride and accomplishment.

The medical laboratories were supporting a force active under every possible climatic condition. Laboratory units with responsibilities primarily clinical, public health, or research, or a combination of these, were appropriately assigned in the Zone of the Interior or continental United States, and overseas. For a proper appreciation and understanding of the scope of operation of the Army Medical Laboratories it would be necessary for a Medical Department officer to have had a tour of duty in Washington, in one of the Service Commands, and in a Theater of Operations. Let us follow a hypothetical laboratory officer of the Medical or Sanitary Corps through such a series of assignments.

In the Surgeon General's Preventive Medicine Service was the Laboratories Division. This division, in conjunction with other divisions of the Preventive Medicine Service, with Personnel Service, Training Division, Supply Service, and others, with the Army Medical School and the Army Institute of Pathology, was responsible for Army Medical Laboratory policy. Included in its mission were the constant review of technical methods and laboratory equipment, the commissioning, assignment, evaluation, and separation of Medical Department laboratory officers, the review of manuscripts submitted for publication, the formulation of tables of organization and equipment, equipment lists, and the publication of directives, Army regulations, Medical Technical Bulletins, Technical Manuals, Field Manuals, etc., relative to medical laboratory activities.

Our officer would have found the Army Institute of Pathology occupied with rapidly expanding an installation which was (1) providing a world-wide diagnostic service, (2) conducting correlative and analytical studies of problem diseases, such as infectious hepatitis, scrub typhus, trench foot, and coronary artery disease. (3) maintaining a continuous program of officer training in pathology, both resident and by means of teaching collections of slides and clinical data, and (4) providing

\* Presented before the Laboratory Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 13, 1946.

training media through its Illustration Service.

He would have found the Army Medical School concerned with an intensive training program in tropical medicine and special laboratory fields for officers, and a course of laboratory technician training for enlisted men. Diagnostic biologicals, such as Weil-Felix antigens, antigens for serologic tests for syphilis and Shigella and Salmonella typing kits were prepared and shipped to our far-flung laboratories. Definitive studies on submitted cultures, sera, chemical and parasitological specimens, and research on immediate problems were conducted in the various divisions of the school. The Veterinary Division, in addition to training and investigation, was preparing vaccines against equine encephalomyelitis and Japanese B encephalitis.

These installations were conducting clinical, public health, and investigative laboratory studies on a scale never before attempted. The field of neurotropic virus and rickettsial diseases was being intensely studied. The medical officer was being provided a type of diagnostic service never before available through a single agency. This service would unquestionably be a stimulus to broader and better laboratory service in civilian medicine of the future.

Our hypothetical officer would have found active laboratory services in the Zone of the Interior hospital system that was established. There were 65 General, 26 Regional, and 142 Station Hospitals operated by the Army Service Forces alone. Though their work was principally clinical, these laboratories also had opportunity for public health and research laboratory work. Pertinent epidemiological studies of local importance were conducted, newer drugs and laboratory methods were evaluated, methods for determination of drug levels in the blood were devised, and studies of increasingly important problem diseases such as malaria, infectious hepatitis and

schistosomiasis were carried out. A large portion of the technician staff in each hospital laboratory would have been found to be civilians. They formed an important stable staff required by the turnover occurring in enlisted technician staffs to meet overseas needs.

To conserve the small supply of experienced tissue pathologists, 19 histopathologic centers were established. These were usually general hospitals located to serve a number of smaller hospitals in a designated area of a service command. The chief of laboratory service in such a hospital served as a regional consultant. Final review of many specimens was conducted at these centers, thereby leaving only essential material for final disposition at the Army Institute of Pathology.

Facilities in the Z. I. hospitals varied. As the war progressed, the General Hospitals became more concerned with patients returning from overseas. Some became special centers dealing primarily with one or several of the various specialties, tropical diseases, neurosurgery, plastic surgery, etc.

The Regional Hospitals arose from strategically located Station Hospitals and provided general hospital facilities for cases originating in the Zone of the Interior.

The Service Command laboratories, of which there were 10, were designed to supplement the epidemiological, sanitary, and diagnostic laboratory services afforded by other medical department laboratories in the Zone of the Interior. The laboratories were established administratively as part of the Service Command Surgeon's Office, the commanding officer of the laboratory being the Service Command Laboratory consultant, and his staff representing a laboratory consultant staff to the Surgeon. As such, all types of laboratory problems originating within the Command were referred to the Service Command laboratory. On epidemiological prob-

lems the laboratory worked with the Surgeon's preventive medicine officer, on clinical laboratory problems, with the Surgeon's medical consultant. In addition to investigating outbreaks of epidemic diseases such as bacillary dysentery, influenza, and streptococcus infections, the laboratories conducted a continuous evaluation program. This was designed to assist the hospital laboratory officer in evaluating his staff. Known chemical, serological, bacteriological, and parasitological specimens were sent to hospital laboratories for examination. Results of these examinations were reviewed by the Service Command laboratory and the hospital laboratories were rated on a sliding scale. These laboratories also conducted continuous on-the-job training programs for laboratory officers and enlisted technicians.

A large responsibility was delegated to the Veterinary Section of these laboratories. Highly trained technical help and elaborate apparatus were required to examine foods of animal origin purchased for Army consumption. Meats, cheese, eggs, milk, and other dairy products had to meet Army standards of acceptability.

Surveys for insect vectors and definitive identification of such vectors were the work of the entomologist of the laboratory. On such problems, the laboratory worked in coöperation with the Service Command Sanitary Engineer.

The laboratory personnel needs were difficult to meet. Requirements for all types of laboratory specialists were relatively greater in the Army than in civilian life. As need for tissue and clinical pathologists increased, the need for expansion of the Sanitary Corps increased. The Sanitary Corps laboratory officer assumed the important rôle for which he was by training and experience equipped. The Sanitary Corps Reserve had helped considerably in the initial staffing of laboratories, but many more

bacteriologists, chemists, serologists, and parasitologists were needed. Criteria for direct commissioning and commissioning from enlisted status were established. At the height of the war there were over 1,200 Sanitary Corps laboratory officers on duty.

Our hypothetical laboratory officer now has an APO address and writes from a Theater of Operations. The ranking laboratory, the Medical General, provides for the theater the facilities provided by the Army Medical School, the Army Institute of Pathology, and the Service Command Laboratories in the Zone of the Interior. Selected specialists staff this laboratory which represents the Theater Surgeon's consultant staff for the investigation of clinical, public health, and research laboratory problems. The unit consists of 23 officers and 76 enlisted men. The commanding officer is the theater laboratory consultant and as such is in contact with the staff of the Theater Surgeon's Office and the laboratories in the field. The facilities of his laboratory are needed in the study of such immediate problems as infectious hepatitis, shock, influenza, bacillary dysentery, and anaerobic infections. By courier, service is provided other laboratory installations. On technical matters, the laboratory maintains communications with the Office of the Surgeon General, the Army Medical School, and the Army Institute of Pathology.

Special units are delegated to particular problems. Missions whose work involves epidemiological and laboratory investigations are dispatched by the Army Epidemiological Board for the study of diphtheria in Germany and Italy, encephalitis in Okinawa and Japan, schistosomiasis in the Philippines, and other problem diseases overseas, and by the Typhus Commission for the study and control of scrub typhus in the Pacific and Burma, and epidemic typhus in Europe and North Africa.



The material is separable into two categories: those conditions that are incidental and those that are service-connected. From a pathologic standpoint, this latter group is not of so much interest as a public health matter but, of course, it does involve aspects of very great public health importance, especially etiology, epidemiology, and prevention. In the other group there are several features that will be of at least actuarial interest to you, and of considerable importance clinically.

Three groups of these conditions have been selected as illustrative of the possibilities. It is to be remembered that our figures cannot be read as incidences of disease; they are simply the actual number of cases received at the Institute—and the majority are fatalities.

TABLE 1-A

*Representative Incidental Diseases in the  
Military Age Group  
January, 1940, to June, 1946*

Fatal Coronary Disease.....	945
Fatal Diabetes .....	75
Aneurysm, Intracranial .....	180
Periarteritis Nodosa .....	141
Congenital Single Coronary Artery.....	9
Gynecomastia .....	435

Any practitioner of experience has seen a case or so of fatal coronary disease in young men, but I do not believe that the comparative frequency of coronary disease in this age group is generally realized. In addition to the fatal cases, we have the opportunity of studying the pathology of the coronaries in the large group that have died as a result of trauma or of disease. The majority of the fatal cases presented no history of previous heart trouble. The Veterans' Administration has begun an extensive follow-up study of those who did have clinical manifestations of cardiac disease and have survived.

The diabetics, likewise, were practically all unsuspected clinically and had been missed on induction examinations.

The item of single coronary artery may seem trivial but one must realize that there are only about twenty cases reported in the literature.

TABLE 1-B

Teratoma, Mediastinum and Lung.....	46
Carcinoma, Bronchus and Lung.....	769
Adenoma, Bronchus .....	43
Lobectomies for T.B.....	37
Tumors, Bone .....	559
Tumors, Testis .....	940

We have been particularly impressed with the high incidence of malignancy, particularly of the lung and, as will be seen in Table 1-C, of tumors of the reticulo-endothelial system and of the blood. The large number of bone tumors and tumors of the testis are not surprising, but the latter group furnish an opportunity for the most comprehensive study of this tumor that has been possible to date. Already it indicates a more precise classification, significant practical prognostic criteria, an appraisal of the effectiveness of various treatments, and some interesting points about embryology, and tumors in general.

TABLE 1-C

Carcinoma, G. I. Tract (Stomach 212).....	553
Carcinoma, Lip .....	758
Carcinoma, Basal Cell, Skin.....	1,463
Melanoma, Malignant, Skin.....	223
Tumors, Brain .....	900
Tumors, Reticuloendothelial and Blood.....	2,036
Hodgkin's Disease .....	568
Giant Follicular Lymphoma.....	124
Leukemias .....	421

We were particularly surprised at the number of carcinomas of the colon. There is a possibility that environment may be a factor in the high incidence of skin cancer. Much of the training was in our southern states and considerable deliberately in desert environment. Sun, wind, and dust, therefore, have been influences.

An analysis of the brain tumors indicates the necessity for revising our notions of the anatomic and age distribution of various types. The glioblastoma multiforme, for example, was considered a tumor predominantly of

late middle age. The majority of this large group, however, are such tumors and are in those below 40.

We have just about concluded that there is more than the expected incidence of tumors of lymphatic and blood forming tissues. The reticuloendothelial system undoubtedly received a great deal of stimulation as a result of multiple immunologic procedures and there is a possibility that this stimulation became irritation at times.

TABLE 2-A

*Service-connected Diseases*

Epidemic Hepatitis	
(Subacute) .....	195
(Acute Fulminant) .....	141
Lower Nephron Nephrosis .....	760
Heat Stroke, Fatal .....	215
Cold Injuries	
(High Altitude, Trench Foot) .....	500
Injuries of Cervical Spinal Cord	
(Diving Accidents) .....	140

TABLE 2-B

Guillain-Barré Syndrome, Fatal .....	48
Infectious Mononucleosis, Fatal .....	9
Meningitis, Epidemic, Fatal .....	355
Waterhouse-Fridericksen Syndrome .....	155
Tuberculosis, Fulminant .....	681
Rheumatic Fever .....	125
Myocarditis .....	1,410

TABLE 2-C

Malaria, Falciparum, Fatal .....	102
Ruptured Spleens in Vivax Malaria .....	13
Coccidioidomycosis .....	98
Scrub Typhus .....	282
Atabrine Dermatoses .....	205
Sulpha Drug Fatalities .....	578

We need not dwell in detail upon the conditions that are service-connected. They are simply presented to indicate the quantity and versatility of our material.

The Army Institute of Pathology began during the Civil War in 1862 as the Army Medical Museum, designed by Surgeon General Hammond to collect material from the battlefields and hospitals that might be used subsequently in the training of Army surgeons. During the years until 1922, the Museum *per se* was the dominant activity. With the enormous impetus of the war, it became obvious, however, that the term "Museum" was inap-

propriate and we were permitted to change the name to the "Army Institute of Pathology."

In addition to the Museum and the Department of Pathology, we have two other divisions that have assumed very important rôles. The Photographic Department, also established during the Civil War, has prospered through the years and branched out more actively during the last war when we organized and equipped nine Medical Arts Units that were sent to the Theaters of Operation. We were also in virtual control of the clinical photography in the general hospitals in this country. From all of these sources, illustrative material poured back to the Institute. In addition to the 90,000 negatives in our original files covering historic subjects and pathology predominantly, we have acquired, therefore, over 100,000 black and white pictures, approximately 30,000 kodachromes and 100,000 feet of motion picture film covering all phases of Medical Department activities and a great deal of clinical photography.

The fourth division is the American Registry of Pathology under the aegis of the National Research Council and made up of fourteen individual registries in various clinical specialties, each in turn sponsored by the parent national society of that specialty. Through these registries we are in very intimate contact with the civilian profession and furnish it consultation service which would not be available so freely otherwise. Included are registries for dental and oral pathology and one of great possibilities, that of comparative pathology sponsored by the American Veterinary Medical Association. In these registries we have accessioned large numbers of cases in the specialized fields. For example, there are over 5,000 bladder tumors; over 20,000 enucleated eyes among which there are about 2,500 melanomas of the uveal tract; over 3,000 lymphatic tissue and

blood tumors, and 850 chest tumors.

This enormous amount of pathologic and illustrative material is available to anyone who is qualified to make legitimate use of it. More specifically, we have developed loan-study sets in various clinical specialties and in more detailed pathologic entities, and have prepared a number of illustrated syllabuses and atlases. These are used particularly by candidates preparing for their special Board examination.

As The Surgeon General became relieved of the urgent and exacting problems of actual warfare, he has had the opportunity to become aware of the possibilities of these great collections

and has energetically been developing plans for the Institute's future. It has long since outgrown its physical facilities, and he proposes to build suitable quarters in a suburban area of Washington to permit not only the exploitation of this accessioned material, but the expansion of postgraduate teaching and research. There will be a research hospital in the Center which will make possible comprehensive studies and training in medico-military problems. The civilian professions will share in this program principally through the Registries by the establishment of fellowships, and by the elaboration of the teaching material.

---

## Passano Foundation Award to Dr. Waksman

Among the events of the American Medical Association's Centennial Meeting in Atlantic City was a dinner on June 12 at which presentation of the 1947 Passano Foundation Award was made to Selman A. Waksman, M.D., microbiologist of the New Jersey Agricultural Experiment Station.

The \$5,000 cash award was presented for Dr. Waksman's original research in the field of antibiotics culminating

in the discovery of streptomycin.

The award was made by Robert S. Gill, President of the Passano Foundation. The dinner was attended by about 100 outstanding medical men. Sir Howard Florey, knighted for his development of the clinical applications of penicillin, made a brief address. Dr. Waksman's address was entitled "Antibiotics and Tuberculosis — a Microbiological Approach."

# Wartime Army Medical Laboratory Activities

Public Health Aspects of Wartime Studies Conducted at the  
Army Institute of Pathology \*

MAJOR RUELL A. SLOAN, M.C., AUS

*Executive Officer, Army Institute of Pathology, Washington, D. C.*

IN the period between Pearl Harbor and October, 1946, over one hundred scientific papers were completed at the Army Institute of Pathology. In these papers there were many observations of public health significance, and this report is primarily a review thereof. It is also evidence of the friendly relationship and spirit of coöperation which has developed between the pathologists in the field, other branches of the Medical Department, and the Institute. The very existence of the data which allow the preparation of this review is a tribute to medical officers at all levels throughout the Medical Department.

Considering the world-wide distribution of the armed forces during World War II, it is significant that approximately one-half of the six hundred pathologists in the Army served for varying periods at the Army Institute of Pathology, while many others stopped for brief visits. Thus an informal liaison on a professional level was maintained without which the growth and advancement of this center of pathology during World War II would have been greatly curtailed. As a result of the excellent coöperation achieved, medicine in this country has

been provided with an extremely valuable heritage. This heritage must be carefully guarded and its post-war development aided by federal and civilian agencies and the individual members of the medical profession. The full value of the material is not yet evident, but as it becomes so it will be recognized that medicine as a whole is deeply indebted to all pathologists in the Army.

The basic mission of the Institute, namely, the advancement of medical knowledge, is as nonpartisan and non-controversial a project as it is possible to find in this world today, and it deserves the active, unqualified support of every medical scientist.

Colonel Ash has outlined for you the history and development of the Army Institute of Pathology during World War II, including the evolution of its various departments, the plans for its future, and a statistical presentation of the material available for study. It is my privilege as Executive Officer to represent the Wartime Staff of the Institute by a survey of their publications with public health significance.

## REVIEW OF SELECTED INSTITUTE PUBLICATIONS

Every war has its outstanding diseases peculiar to the times and circumstances. Malaria and dysentery were widely prevalent during the Civil War, typhoid fever during the Spanish-

---

\* Presented by Major Sloan for the Wartime Staff of the Army Institute of Pathology before the Laboratory Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 14, 1946.

American War, influenza and other respiratory diseases during the First World War, and malaria, scrub typhus, epidemic hepatitis, lower nephron nephrosis, and radiation disease during the war recently ended.

#### INFECTIOUS DISEASES

In the field of infectious diseases a great many problems arose. Of the bacterial group, cutaneous diphtheria and bacillary dysentery were serious problems in the Mediterranean Theater. Of the rickettsial group, scrub typhus was important in the Southwest Pacific; of the protozoal group, malaria, assumed proportions which required control to avert military failure in several theaters of war. Of the virus group, epidemic or virus hepatitis was of particular significance as the only pandemic disease of World War II. Of the fungus group, coccidioidomycosis was a problem throughout the southwestern training areas of this country. Material of many other diseases has been reported and, through the chain of evacuation set up by AR 40-410,<sup>1</sup> and TB MED 19,<sup>2</sup> all autopsy and selected surgical material has been forwarded to the Army Institute of Pathology for review and final disposition.

*Scrub typhus and other rickettsial diseases* are discussed by Major Arthur C. Allen, M.C., and Dr. Sophie Spitz, contract surgeon,<sup>3</sup> in a detailed comparative study of the pathology of scrub typhus and other rickettsial diseases. Acute interstitial myocarditis is reported by the authors in 93 per cent of the scrub typhus cases, 83 per cent of epidemic typhus, and 78 per cent of the cases of Rocky Mountain spotted fever. However, a later study<sup>4</sup> shows no residual changes in the heart in 3 cases in which death from accidental causes followed recovery from scrub typhus. A more complete study of this problem of potential economic value to taxpayers and veterans will require the

coöperation of civilian medicine and the federal services. Actually, an autopsy should be performed in every case of accidental death of a veteran of World War II to determine the residual effects of diseases which prior to the war were unusual in the United States.

*Malaria*—In a report on the pathology of falciparum malaria,<sup>4</sup> Dr. Spitz refers to Helsen's report<sup>5</sup> on epidemics among drug addicts, indicating that falciparum malaria was a problem here even before the war. It is to be expected that it may assume greater than pre-war magnitude now that the troops have returned and since overseas air transport has greatly increased the danger of foreign-incurred infections.

The pathologic changes in the various organs in 50 cases of falciparum malaria are described in detail. In this series "localization" or concentration of parasites occurs only in the spleen, liver, and bone marrow. Parasitized erythrocytes have been found to be otherwise uniformly distributed in other organs, even though the clinical symptoms may point to one primarily. The theory of *selective localization* of parasitized cells, in the author's opinion, cannot by itself, account for the protean clinical phenomena so characteristic of falciparum malaria.

*Tropical Diseases*—Col. J. E. Ash, M.C., and Dr. Spitz<sup>6</sup> present in an "Atlas of Tropical Diseases" excellent pictorial coverage, distribution maps and diagrams of the life cycles of the causative organisms of all the primary tropical diseases as well as many other diseases common in, but not necessarily confined to, the tropics. As this volume was published over a year ago no further mention will be made of tropical diseases.

*Virus Diseases*—Col. Balduin Lucke in 3 reports,<sup>7-9</sup> and Col. Lucke and Col. Tracy Mallory in one joint report<sup>10</sup> on epidemic hepatitis discuss the clinical picture, etiology, epidemiology,

and pathologic anatomy in fatal and recovered cases, and summarize the present knowledge of the pathologic physiology in a total of 338 cases. Epidemic hepatitis has been recorded during every war for the past 100 years, but is not limited to wars or armies. It is endemic throughout the world; occurs in all races and in all ages, although most commonly in children and young adults. Outbreaks may develop wherever large groups of susceptible people are brought into close contact. Since World War I the disease has been on the increase, and latest reports<sup>10</sup> also indicate an increase in severity.

Many terms have been used to describe this disease. Recent advances in knowledge of its virus nature suggest that the confusion may be resolved by the general adoption of the term "virus hepatitis."

The virus has not as yet been cultivated, nor has an animal other than man been found susceptible. At present the only means of demonstrating the virus is by human transmission. The virus has been shown to exist in the blood, feces, urine, and nasal washings. Under natural conditions it is probably transmitted either through the alimentary tract by contaminated food or water, or through the nasopharynx by droplet infection. Under artificial conditions the disease may be transmitted by parenteral injections of whole blood, plasma, or serum from persons harboring the disease; thus, epidemiologic variants may be recognized—naturally occurring hepatitis and inoculation hepatitis. The latter form is of particular public health interest because it is the present belief that definite lesions exist before clinical symptoms first become manifest. This is particularly true if jaundice is used as a clinical guide, for its duration or degree, presence, or absence, is not a measure of the severity of hepatic involvement. Accordingly, it would be possible to

take blood from a person in the very early stage of the disease and unknowingly use it in parenteral therapy.

The duration of the disease in fatal cases during the 1942 epidemic in the United States Army was usually from 4 to 6 weeks. During the past 2 years, the majority of fatal cases have been running a more fulminant course with a duration of less than 10 days. In approximately 0.3 per cent the disease ends fatally.

In the non-fatal cases, the structure of the liver has been studied in patients dying as a result of accident<sup>9</sup> 2 weeks to 3 years after the initial attack. In none of the cases was there evidence that the disease was progressing toward a cirrhotic state. The conclusion is that complete restoration of hepatic parenchyma occurs in the vast majority of non-fatal cases of hepatitis.

*Fungus Diseases* — Prior to World War II a mere acquaintance with coccidioidomycosis usually had been considered sufficient for the physician outside of the endemic areas. That this is no longer true is obvious from the fact that this disease occurred in approximately 6,000 members of the armed forces in clinically recognizable form and in probably a far greater number as a subclinical infection. These patients have been scattered literally throughout the world. Dr. W. D. Forbus, resident consultant, reports a study of the material from 95 cases of the disseminated type of coccidioidomycosis<sup>11</sup> with special emphasis on the pathogenesis.

Coccidioidomycosis is primarily and predominantly a pulmonary disease, the mortality of which is negligible. When death occurs, Forbus believes, it is always associated with an endogenous reinfection. The residual pulmonary lesions of clinically healed cases contain vegetative organisms in all stages of development. These residual foci may serve as the source of disseminated in-

fection by bronchiolar ulceration and aspiration or by vascular dissemination months or years after evidence of pulmonary disease has disappeared.

Disseminated, secondary reinfections will continue to occur in members of the armed forces who were trained in the areas of the Southwest for approximately ten years and will cause a number of deaths. The author does not consider it likely that coccidioidomycosis will spread to non-endemic areas.

*Tuberculosis*—Col. Joseph D. Aronson<sup>12</sup> in an analysis of the occurrence and anatomic characteristics of fatal tuberculosis in the United States Army during World War II notes the following interesting statistical comparison. During World War II the mortality from tuberculosis in the United States Army, per 100,000, was 6.7, while among the civilian population during 1940 the rate was 47.7. In World War I the incidence of fatal cases among military personnel was 65.9, and in the civilian population in 1920 it was 151.4 per 100,000.

*Infectious Mononucleosis*—Major E. B. Smith, M.C., and Lt. Col. R. P. Custer, M.C., report an interesting complication in a study of 7 cases of rupture of the spleen in infectious mononucleosis. The authors ascribe the weakening of the splenic capsule prior to rupture to dilution and even dissolution of the capsule and trabeculae, the result of a cellular reaction of varying intensity. The time element is of interest to the examining physician. Rupture occurred in all cases between the 14th and 21st days of illness. The relationship between minor trauma and rupture is stressed. Simple palpation, climbing into bed, jarring or twisting, or straining at stool are listed as precipitating factors.

The authors recommend that when infectious mononucleosis is suspected, palpation be avoided, particularly after the 8th to 10th day of illness, and

that diagnosis be established by the more certain means available.

*Other diseases of infectious nature* of interest to public health physicians have been reported by Major Webb Haymaker<sup>14</sup> in "Infections of the Central Nervous System Following Tooth Extractions," by Major J. E. Ehrlich, M.C.,<sup>15</sup> in "Erysipelothrix rhusiopathiae or Swine Influenza in Man," and by Majors Jones and Davis<sup>16</sup> in "Leptospirosis in War Dogs."

#### DISEASES DUE TO PHYSICAL, MECHANICAL, AND CHEMICAL INJURIES

Under the conditions of modern warfare, it is natural that diseases due to mechanical, physical, and chemical agents should provide the largest volume of material for study. During peacetime such agents are under adequate control, or are so limited in use as to make it difficult to obtain sufficient material for detailed study. During World War II, these agents ranged all the way from the radiation incident to the atomic bomb through modern therapeutic agents to frank poisons.

*Physical Agents—Radiation, Heat, Cold, Anoxia:*

*Radiation Disease*—The injury incident to the gamma radiation of the atomic bomb is not new, but surely the number of persons so injured is unprecedented. The follow-up study of such a group not only offers great opportunities for research but is essential, from a public health standpoint, if proper control methods are to be found.

Work on the report of the "Joint Committee for the Investigation of the Effects of the Atomic Bomb in Japan"<sup>17</sup> has recently been completed at the Army Institute of Pathology. After necessary War Department review, it will be released for publication. The public health aspects are difficult to comprehend fully. The genetic-aftereffects, the carcinogenic effects, and

the industrial medical problems that are presented by the production and potential use of the atomic bomb are but a few of the extensive fields that will require study. The carcinogenic effects of similar agents are known, so it is logical to expect an increase in certain types of neoplastic disease.

To aid in the continuation of the original work and in the initiation of new studies, all related records are being retained as a unit at the Army Institute of Pathology. This material will be available to interested individuals and groups subject to the policies of the War Department. *Injuries due to heat*,<sup>18, 19</sup> *cold*,<sup>20, 21</sup> and *anoxia*<sup>22-24</sup> are also reported. In non-fatal cases of heat stroke cerebral and cerebellar lesions, believed to be irreversible, occur and serve as an adequate pathologic basis for the cerebellar and mental sequelae which have been reported. In cold injuries the presence of thrombosis of the agglutinative type provides a rational basis for heparin therapy. The effects of chronic anoxia in man have yet to be evaluated. However, with the advance in high altitude and long range air travel, the possible dangers of acute and chronic cerebral asphyxiation should be kept in mind. A follow-up study of non-fatal cases will require a patient screening of the records of hundreds of air corps combat veterans in the hope of evaluating the as yet unknown residua. The Army Institute of Pathology serving as the Central Laboratory for the Veterans' Administration, will be able to render assistance in such studies.

*Sudden death*—Dr. Alan Moritz, Resident Consultant, and Capt. Norman Zamcheck, M.C.<sup>25</sup> present an analysis of the natural causes of sudden death in 1,100 soldiers. The authors list heart disease, intracranial hemorrhage, and meningococcemia as the three principal causes. Meningococcemia, as a cause of sudden death has not been sufficiently

emphasized. The authors point out the significance of degenerative changes in the adrenal cortex in this disease.

*Homicide and suicide*—Capt. Norman Zamcheck, M. C., and Mr. Murray Geisler, Statistician,<sup>25</sup> report a review of 1,100 suicides and 700 homicides occurring in soldiers under non-battle conditions. This large series demonstrates the applicability of the statistical method for differentiating between homicide and suicide. They correlate such factors as age, race, military status, time of day, day of week, weapon used, and site of injury.

*Chemical Injuries: Sulfonamides—Ethylene Glycol*—The following list (Table 1) is presented as a simple compilation of the various chemical agents listed in the Institute files. Time has permitted detailed study of this material in only a few instances.

*Ethylene Glycol*—Lt. Col. C. A. Pons and Lt. Col. R. P. Custer, M.C.,<sup>27</sup> report a clinicopathologic study of 18 fatal cases of acute ethylene glycol poisoning (anti-freeze intoxication) with detailed description of the histopathologic changes in the kidney and brain. Use is made of histologic examination with polarized light to emphasize the extensive double refractile crystallosis with calcium oxalate in the kidney and brain. The crystal formation is regarded as due to oxidation of ethylene glycol to oxalic acid and deposition as calcium oxalate.

Symptoms referable to the central nervous system were the most prominent part of the clinical picture. This is in keeping with the histologic findings in all 18 cases which showed focal hemorrhage and in some instances actual chemical meningo-encephalitis. Crystals, analogous to the oxalate deposits in the kidneys, were observed in a few of the engorged vessels at the point of contact between tissues and cerebrospinal fluid.

*Sulfa Injury*—Lt. Col. A. J. French,



TABLE 1

*Fatalities Due to Chemical Agents in World War II  
On File at the  
Army Institute of Pathology*

<i>Poison Group</i>	<i>Subtotal</i>	<i>Total</i>	<i>Poison Group</i>	<i>Subtotal</i>	<i>Total</i>
<i>Gas</i>			<i>Cocaine-Strychnine</i>	30	30
Nitrous oxide	14		<i>Morphine</i>		
Other members of group	3	17	Codeine	4	
<i>Cyanide</i>	26	26	Morphine	13	
<i>Alcohol</i>			Opium	1	18
Ethyl alcohol	462		<i>Heavy Metal</i>		
Methyl alcohol	496		Antimony	2	
Aniline	2		Arsenic	26	
Carbon Tetrachloride	18		Chromium	3	
Chloral	3		Lead	5	
Chloroform	6		Bichloride of mercury	3	
Creosol	3		Other members of group	3	42
Ethylene glycol (Prestone)	18		<i>Hydroxides and Carbonates</i>		
Paraldehyde	6		Lye	6	
Phenol	21		Other members of group	3	9
Phosphorus	11		<i>Halogen</i>		
Other members of group	9	1,055	Fluoride	10	
<i>Barbiturate</i>			Other members of group	2	12
Amytal	3		<i>Borates and Chlorates</i>	8	8
Barbital	2		<i>Miscellaneous</i>	107	107
Trinitrotoluene	2		<i>Grand Total</i>		1,425
Pentothal sodium	39				
Phenobarbital	7				
Other members of group	48	101			

M.C., reports on the study of hypersensitivity in the pathogenesis of the histopathologic changes associated with sulfonamide therapy.<sup>28</sup> Of approximately 500 cases of sulfonamide reaction studied, 76 were considered uncomplicated by other disease factors and the histologic changes of these cases are given in detail.

Evidence of individual susceptibility to initial and repeated courses of sulfonamide drugs, which has accumulated in the literature, is substantiated by this series of cases.

Sensitization of large groups of patients with prophylactic doses of sulfonamide may result in an increase in the number of histopathologic lesions encountered at autopsy. The accurate evaluation of the residual changes will require autopsy follow-up in cases with previous severe but non-fatal "sulfonamide sickness." Increased caution must be observed in prophylactic and thera-

peutic use of sulfonamide for minor infections.

*Lower Nephron Nephrosis*—In any highly industrialized country lower nephron nephrosis will continue to be a constant problem, principally in the field of industrial medicine, but also in general medical practice, where many of the precipitating factors are complications of routine therapy.

This syndrome was the most frequent form of fatal kidney disorder encountered among military personnel during the war. Among 427 battle casualties dying in the hospital the incidence was 18.6 per cent.

Col. Balduin Lucke reports a study of 538 fatal cases of this syndrome,<sup>29</sup> characterized by oliguria, heme pigment excretion, azotemia, hypertension, and uremia which developed in a variety of conditions associated with the destruction of tissues or intravascular hemolysis. These include crushing injuries,

nontraumatic muscular ischemia, uteroplacental damage, burns, transfusions with incompatible blood, blackwater fever and other types of intravascular hemolysis, heat stroke, sulfonamide intoxication, alkalosis, poisoning with vegetable and chemical agents. Once the characteristic symptoms set in, the mortality is high. Death usually occurs within 10 days.

Specific lesions occur in the kidney. The essential changes are selectively distributed over the lower segment of the nephron and comprise focal degeneration or necrosis, presence of pigmented protein casts, secondary inflammatory reaction in the surrounding stroma and thrombosis of thin-walled veins. The pathogenesis of the lesion has not yet been established.

The relation of symptoms to lesions is likewise incompletely known. It is probable that resorption of glomerular filtrate through injured segments of the lower nephron plays a very important part in the development of renal insufficiency.

Lower nephron nephrosis is not always fatal. Evidence is accumulating which shows residual changes in the kidneys indicative of earlier non-fatal lower nephron involvement. This is another problem that will require review of a large number of accidental deaths, if material, free of other diseases, is to be collected for study.

#### NEOPLASTIC DISEASES

Col. Ash has referred to the extensive material on bladder, kidney, prostate, lung, and skin tumors. In addition, Major Nathan B. Friedman and Dr. Robert A. Moore, resident consultant,<sup>30</sup> report on 922 cases of tumors of the testicle. The number of cases on file has now increased to 1,054 and follow-up is possible in approximately 850 of these. The result of this study has been a clarification of teratologic aspects and classifications.

Some of the phenomena encountered in this interesting group of tumors have spectacular implications; for example, the spontaneous regression of some of the malignant tumors and the differentiation of a malignant into a benign neoplasm. Especially striking from the public health viewpoint has been the long delay between the first symptoms of a testicular swelling and the removal of the tumor. Diagnoses of all sorts of inflammation, hydrocele and epididymitis, were made months before the diagnosis of tumor was arrived at. As part of the public health cancer programs, all cases of swelling of the testis should be considered first as possible tumor. Since one group of them, the seminomas or germinomas, which make up at least one-third of the series (307 cases), are highly radiosensitive and apparently curable by surgery and radiation, considerable saving of life may be expected by prompt action.

*Hodgkin's Disease*—Lt. Col. William E. Bernhardt and Lt. Col. R. P. Custer<sup>38</sup> report on the study of 700 cases of Hodgkin's disease; this large series, consisting of 500 cases with serial biopsies and 200 autopsies, provides sufficient material for a detailed study of the minor variations. The transition from para-granulomatous to granulomatous form to frank sarcoma of lymphoid or reticulum cell type is clearly established, and the relationship to giant follicular lymphoblastoma demonstrated. In a few cases of this large series it was possible to show a retrograde transition from sarcoma to granuloma. The authors suspect that Hodgkin's disease is a viral neoplasm.

In addition to these studies, tumor surveys have been completed covering intracranial neoplasms,<sup>31, 32</sup> gastrointestinal tumors,<sup>33</sup> teratomas of the anterior mediastinum,<sup>34</sup> odontogenic tumors,<sup>35</sup> and others.

*Coronary Artery Disease*—As part of a continuing study of various aspects of

TABLE 2  
*Diseases Associated with Myocarditis*

	Cases		Cases
Rickettsial Diseases		Septicemia	
Scrub Typhus	227	Streptococcus	11
Epidemic Typhus	23	Staphylococcus	34
Rocky Mountain Spotted Fever	9	Pneumococcus	9
Diphtheria	144	Other Acute Bacteremia	15
Subacute Bacterial Endocarditis	208		
Rheumatic Heart Disease	130	Acute Glomerulonephritis	14
Meningococcemia	111	Acute Tonsillitis	12
Scarlet Fever	24	Acute Nasopharyngitis	41
		Cellulitis, Lymphangitis and wound infections	13
Weill's Disease	7		
Relapsing Fever	6	Tularemia	1
Syphilis (Gummatous)	2	Brucellosis	2
		Miscellaneous (Postinfections)	13
Chagas Disease	1		
Schistosomiasis	5	Exfoliative Dermatitis	7
Malaria	5	Arsenical Reaction	1
Trichinosis	2	Sulfonamide Hypersensitivity	105
Acute Encephalitis	13	Idiopathic	43
Poliomyelitis	13		
Infectious Mononucleosis	6	Starvation	33
Measles	5		
Guillain-Barré Syndrome	3	Heat Stroke	
Mumps	1	Surviving less than 24 hours	16
Epidemic Hepatitis	1	Surviving more than 24 hours	13
Smallpox	1	Carbon Monoxide Poisoning	1
Atypical Pneumonia	32	(limited to patients who survived for an appreciable interval after the lethal exposure)	
		Emetine	1
Tuberculosis	9	Burns	11
Boeck's Sarcoid	3		
Coccidioidomycosis	11	Total	1,402
Blastomycosis	2		
Actinomycosis	1		
Torulosis	1		

cardiac diseases, Dr. Wallace Yater, resident consultant, Major Wilson Brown, and associates<sup>36</sup> report the first paper of a series. In a statistical and clinicopathologic study of 443 cases of coronary disease, the authors stress points that are of special interest to medical examiners, industrial and induction board physicians, and others. Coronary artery disease as the cause of sudden death should be carefully searched for in all cases if the age of the patient is 20 years of age or more.

*Myocarditis*—It is rarely possible under peacetime conditions to collect a sufficiently large series of cases of inflammation of the heart to allow a broad study of the numerous etiologic possibilities. This is especially true in the younger age groups. The Army policy of centralizing its tissue pathology has made such a study and similar future

studies possible. Lt. Col. Ira Gore, Dr. Otto Saphir, resident consultant, and associates<sup>37</sup> are basing their studies on 1,402 cases of myocarditis associated with many different diseases (Table 2).

Since rheumatic heart disease was a cause for rejection at the time of induction their series shows only 130 cases of rheumatic carditis, leaving 90 per cent of the series due to other causes. Clinical myocardial involvement had not been suspected in the majority of this large group.

#### PROFESSIONAL RECORDS

In view of the potentialities of a collection of 103,000 cases, probably representing at least 300,000 diagnoses, since Pearl Harbor alone, it is natural to suppose an interest in the method used to record diagnoses, in the use of this material for teaching, and the

availability of these records to interested persons or groups. To handle the exceptionally heavy volume of cases it became obvious that standardization of diagnosis and utilization of modern mechanical methods were required. The *Standard Nomenclature of Disease* was selected as a standard code because of its widespread use and adaptability to machine records. Basic International Business Machines for punch cards were selected to handle the punching and sorting. Data, such as the case number, type of materials in the files, i.e., protocols, slides, blocks, tissue, etc., also age, race, sex, global area in which disease occurred, military status, duration of disease, treatment, operations, and type of trauma were placed in the first 22 lines of the standard 80 line IBM card. The remainder of the card, lines 23 to 80, were reserved for 7 diagnoses of 8 digits each. Additional cards for diagnoses are used as required.

It must be emphasized that the procedure here outlined was adopted as a rapid means of finding cards of a given diagnosis along with a maximum amount of clinical and administrative data. Thus, in a few minutes, a series of cases having many factors in common can be selected for further study. Special histopathologic or experimental studies having a wide range of individualized data are not adaptable to a single coding procedure and therefore must be handled as separate coding problems.

#### TEACHING MATERIAL

During the early part of the war when the need for a rapid expansion of knowledge of tropical diseases was necessary, the Institute, with the help of the Markel Foundation, prepared and forwarded to all medical schools of the United States and Canada comprehensive sets of colored lantern slides, microscope slides, paraffin blocks and tissues. This work was an expansion of a decentralized teaching program of the

TABLE 3

*Material Available for "Home" Study  
Army Institute of Pathology  
Washington 25, D. C.*

	Sets	Subjects
Histopathology Teaching Sets	600	30
Clinicopathologic Conference Sets	84	28
Kodachrome Lantern Slide Sets	23	2
Roentgenologic Teaching Collections	80	20
	<hr/> 787	<hr/> 80

American Registry of Pathology which was started many years earlier. Further expansion of these facilities is continuing. There are at this time 787 teaching sets, covering 80 subjects, available for loan through the American Registry of Pathology. New histology slide, lantern slide, and film strip collections on pertinent subjects are in preparation.

#### POLICY AND PROCEDURE FOR USE OF PATHOLOGIC MATERIAL

Now that the processing of the war-accumulated material is slowly drawing to a close, study of the best method of making this material generally available and insuring its maximum utilization is under way. For many years the Acts of Congress of 1892 and 1905 and Army Regulation 40-410 in its various revisions have emphasized the availability of the medical resources of the Institute (formerly the Army Medical Museum). However, prior to World War I, diversification was limited and accordingly the appeal to the medical profession as a whole was slight. During World War II the selected material forwarded by hundreds of field units has grown into the largest diversified collection of usual and unusual diseases known to medicine. Primary processing, a formidable task in itself, has kept step with the arrival of an average of nearly 3,000 cases per month for the year 1945. Detailed analysis has been completed on some of the important material; nevertheless, there remains a vast untapped store of unanalyzed material

that will require many years of patient, careful, and coöperative effort for full exploitation. Many persons have requested permission to use this material. In so far as possible, full availability will be granted to qualified persons. To handle requests a review board has been appointed by the Director.

At the present and in the immediate future, limitations of space and personnel for other than basic review, teaching, and research will impose some restrictions on the use of the Institute file. However, it is expected that personnel adjustments and other arrangements necessary to develop the facilities for study and investigation by other than the immediate staff of the Institute will keep pace with applications for use of the Army Institute of Pathology material.

## REFERENCES

1. The Army Institute of Pathology. War Department Army Regulations, 40-410, June 7, 1946.
2. Facilities for Historiopathologic Diagnosis in the United States Army. War Department *Tech. Bull.* TB Med 19.
3. Allen, A. C., and Spitz, S. A Comparative Study of the Pathology of Scrub Typhus and Other Rickettsial Diseases. *Am. J. Path.*, 21, 4:603-681, 1945.
4. Spitz, S. The Pathology of Acute Falciparum Malaria. *Mil. Surgeon*, 99, 5:555-572, 1946.
5. Helsen, M. Epidemic of Fatal Estivo-autumnal Malaria. *Am. J. Surgeon*, 26:111-123, 1934.
6. Ash, J. E., and Spitz, S. *Pathology of Tropical Diseases*. Philadelphia: Saunders, 1945.
7. Lucke, B. The Structure of the Liver after Recovery from Epidemic Hepatitis. *Am. J. Path.*, 20, 3:595-619, 1944.
8. Lucke, B. The Pathology of Fatal Epidemic Hepatitis. *Am. J. Path.*, 20, 3:471-593, 1944.
9. Lucke, B. Epidemic Hepatitis. Tenth Christian Ferger Lecture of the Institute of Medicine and Chicago Pathological Society, Chicago, January 14, 1946.
10. Lucke, B., and Mallory, T. The Fulminant Form of Epidemic Hepatitis. *Am. J. Path.*, 22, 5: 867-945, 1946.
11. Forbus, W. D. Coccidioidomycosis. *Mil. Surgeon*, 99, 5:653-719, 1946.
12. Aronson, J. D. The Occurrence and Anatomic Characteristics of Fatal Tuberculosis in the U. S. Army during World War II. In press.
13. Smith, E. B., and Custer, R. P. Rupture of Spleen in Infectious Mononucleosis. *Blood, J. Hematology*, 1, 4:317-333, 1946.
14. Haymaker, W. Fatal Infections of the Central Nervous System and Meninges after Tooth Extraction. *Am. J. Orthodontics & Oral Surgery*, 31, 3:117-188, 1945.
15. Ehrlich, J. C. Erysipelothrix rhusiopathiae Infection in Humans. *Arch. Int. Med.*, 78:565-577, 1946.
16. Jones, T. C., and Davis, C. L., et al. Control of Leptospirosis in War Dogs. *Am. J. Vet. Res.*, 6:120-128, 1945.
17. Joint War and Navy Departments Publication. Report of the Joint Commission for the Investigation of the Effects of the Atomic Bomb in Japan. In press.
18. Malamud, N., Haymaker, W., and Custer, R. P. Heat Stroke. *Mil. Surgeon*, 99, 5:397-449, 1946.
19. Schickel, E. Environment in Fatal Heat Stroke. An Analysis of 157 Cases Occurring in the Armed Forces of the United States during World War II. *Mil. Surgeon*. In press.
20. Friedman, N. B. The Pathology of Trench Foot. *Am. J. Path.*, 21, 3:387-433, 1945.
21. Friedman, N. B., and Kritzer, R. A. The Pathology of High Altitude Frostbite. *Am. J. Path.*, 23:173-187, 1947.
22. Titrud, L. A., and Haymaker, W. Cerebral Anoxia from High Altitude Asphyxiation. In press.
23. Ginzler, A. M., and Haymaker, W., et al. The Occurrence and Distribution of Lesions in the Central Nervous System of Dogs Subjected to Cyanide Poisoning. *Arch. Path.* In press.
24. Church, R. E., and Loeser, L. H. Injury to Cerebral Cortex Following Anoxemia and Exsanguination. *Bull. U. S. Army Med. Dept.*, 83, 1944, p. 104.
25. Zamcheck, N., and Geisler, M. A. Homicides and Suicides of World War II. In press.
26. Moritz, A. R., and Zamcheck, N. Diseases Responsible for Sudden and Unexpected Deaths in Young Soldiers. *Arch. Path.*, 42:459-494, 1946.
27. Pons, C. A., and Custer, R. P. Acute Ethylene Glycol Poisoning. *Am. J. M. Sc.*, 211:544-552, 1946.
28. French, A. J. Hypersensitivity in the Pathogenesis of the Historiopathologic Changes Associated with Sulfonamide Chemotherapy. *Am. J. Path.*, 22, 4: 679-701, 1946.
29. Lucke, B. Lower Nephron Nephrosis. *Mil. Surgeon*, 99, 5:371-396, 1946.
30. Friedman, N. B., and Moore, R. A. Tumors of the Testes. *Mil. Surgeon*, 99, 5:573-593, 1946.
31. Bennett, W. A. Survey of Intracranial Tumors. *Mil. Surgeon*, 99, 5:594-652, 1946.
32. Kublenbeck, H., and Haymaker, W. Neuroectodermal Tumors Containing Neoplastic Neuronal Elements. *Mil. Surgeon*, 99, 4:273-304, 1946.
33. Hunter, B., Jr., and Ehrlich, J. C. Survey of Gastrointestinal Tumors. *Surg. Gynec. & Obst.* In press.
34. Schlumberger, H. C. Teratoma of the Anterior Mediastinum in the Military Age Group. *Arch. Path.*, 41, 4:398-444, 1946.
35. Thoma, K. H., and Goldman, H. M. Odontogenic Tumors. *Am. J. Path.*, 22, 3:433-471, 1946.
36. Yater, W. M., Brown, W. G., and associates. Coronary Disease in Men between 18 and 39 Years of Age. In press.
37. Gore, I., and Saphir, O. Myocarditis. A Classification of 1,402 Cases. *Am. Heart J.* In press.
38. Bernhardt, W. E., and Custer, R. P. Hodgkin's Disease. In press.

# Wartime Army Medical Laboratory Activities

Wartime Activities of the Army Veterinary Laboratories \*

RAYMOND RANDALL, COLONEL, V.C., U.S.A.

*Director, Army Veterinary School, Medical Department Professional Service Schools, Army Medical Center, Washington, D. C.*

IN presenting the wartime veterinary laboratory activities of the Army, it is believed appropriate first to give a brief description of the functions of the Army Veterinary Service. As a component of the Medical Department, it is charged with duties falling under two definite heads, those with respect to the conservation of the health of public animals and the care of these animals when disabled, and those concerned with the inspection of meat, meat food, and dairy products required by the Army.

The dual nature of the functions of the veterinary service, concerning animals on one hand and human beings on the other, with the recognition that animal diseases have a close connection with human disease, requires a close relationship with the general service of the Medical Department. This relationship is reflected in the scope of the wartime veterinary laboratory activities that included: (1) the chemical and bacteriological analysis of meat, meat food and dairy products, and research activities pertaining to this field; (2) clinical diagnostic laboratory procedures; (3) research on the control of animal diseases; and (4) 'research, de-

velopment, and the large scale production of biologics.

Of the 2,200 veterinary officers and 5,000 enlisted men who constituted the wartime Army veterinary service, approximately 100 officers and a proportionate number of enlisted and civilian technicians were required to perform these laboratory functions.

Since veterinary laboratory service was required not only by the Medical Department but also by the Quartermaster Corps and the Chemical Warfare Service, there existed three types of laboratory and research work; namely, medical, quartermaster, and chemical warfare. While some veterinary personnel were engaged solely in the performance of routine laboratory procedures and others in development and research work, most of the members of the Corps engaged in both types of activities. Certain of the investigations dealt with research and development activities pertaining to biological warfare and some were in connection with military missions.

## SERVICE COMMAND LABORATORIES

To meet the requirements for laboratory service in the United States, nine service command laboratories were established. To each was assigned a veterinary section consisting of one or more veterinary officers and several

\* Presented before the Laboratory Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 14, 1946.

qualified enlisted and civilian technicians. Veterinary laboratory service for the Third Service Command was conducted at the Army Veterinary School, Army Medical Center, Washington, D. C.

The major activities of the veterinary sections of these laboratories involved chemical and bacteriological examinations of meat, meat food, and dairy products. Such examinations were desired to determine whether the foods met specifications and contract requirements as to type and quality.

Approximately 225,000 food specimens of animal origin were received for analysis during World War II. They were representative samples from the more than 30,000,000 lbs. of meat and dairy products which were being inspected daily by Army veterinary personnel at the source of supply at the time the war ended. The samples included such foods as canned meat products, desiccated eggs, fresh, evaporated, powdered, and frozen milk, frozen or powdered ice cream, butter, and cheese. As an example of the increase in variety of canned meat products which were supplied to our soldiers as the war progressed, it may be pointed out that when we entered World War II there were only six canned meat dishes in the Army ration, but by the end of 1944, this had been increased to fifty.

A valuable contribution to the war effort was the application of adequate laboratory control measures which insured the wholesomeness and safety of the 65,000,000 lbs. of fluid milk which were required each month, at the peak, to provide every man in training in the United States with at least  $\frac{1}{2}$  pint of fresh milk daily. The development and improvement of methods for the production of dried eggs and powdered milk resulted, in part, from Army laboratory investigations and research findings.

The chemical examinations of food of

animal origin included quantitative analyses for protein, salt, calcium, phosphorus, acidity, moisture, and fat. Gravimetric analyses were made for moisture, crude fiber, total solids, cereal, sugar, and net weight and colorimetric analyses for sodium nitrite and sodium nitrate. Gasometric analyses were made for carbon dioxide and oxygen in both dried milk and desiccated eggs.

The spectrophotometric method of analysis was employed to determine the copper and iron content of dried food products. The palatability index of desiccated eggs was determined by fluorometric analyses. The keeping qualities of lard and shortening were judged by the active oxygen test.

Bacteriological examinations of foods of animal origin included standard plate counts, coliform counts, yeast and mold counts, examination of canned foods for sterility and the identification and typing of microorganisms associated with canned food spoilage.

In the interests of uniformity of methods and accuracy of laboratory results, some of the Service Command laboratories coöperated with the laboratories of the egg, dairy, and meat industries in various studies along bacteriological and chemical lines. These studies were of great value in promoting a better understanding between the Army and commercial food industries.

In addition to the chemical and bacteriological examination of foods of animal origin, these laboratories were equipped to perform complement-fixation tests for glanders, equine infectious abortion, and trypanosomiasis, agglutination tests for brucellosis, and virus neutralization tests. Microscopic examinations and animal inoculation tests were made for rabies. Examination for the presence of pathogenic bacteria were carried out on animal specimens and histopathological examinations were made of tumors and other tissues.

One of the important functions of the veterinary section of Army laboratories, in both the United States and those overseas, was the procurement, breeding, and maintenance of stocks of various laboratory animals. This task which was of special importance to Army and general laboratories overseas was most difficult to perform under field conditions, where climate, facilities, and feed were often unsuitable and rarely conducive to the breeding and maintenance of laboratory animals.

#### OVERSEAS VETERINARY LABORATORY SERVICE

There was a total of nineteen Army medical laboratories and four medical general laboratories organized and equipped for laboratory operations in the held under wartime conditions. All of these units, with the exception of the 14th Medical Laboratory, were equipped and trained in the United States before deployment overseas.

Each of these laboratories included a veterinary section whose objectives and activities were the same as those of Service Command laboratories in the United States.

Due to the global type of warfare, the veterinary activities of these laboratories varied widely according to the types of animal diseases which were present and the quality and quantity of available perishable foodstuffs.

A veterinary laboratory officer did not confine his entire time and field of endeavor to matters strictly pertaining to veterinary science. He was a member of a highly specialized team whose mission it was to furnish a complete laboratory service for a given area. Consequently he had a wide variety of assignments. For instance, the veterinary section of a Mediterranean Theater laboratory was the Salmonella typing center for the theater and developed a polyvalent type "O" Salmonella antiserum for the rapid detec-

tion of Salmonella organisms. In another laboratory located in the Pacific area, the veterinary section participated in the study of scrub typhus and poliomyelitis. The veterinary officer of a European Theater laboratory was assigned for a time to work with the Combined Intelligence Office.

#### VETERINARY RESEARCH LABORATORY

The Army Veterinary Research Laboratory, originally located at the Front Royal Quartermaster Depot and now located at the Quartermaster Remount Depot, Fort Robinson, Nebraska, was activated in 1939 to study periodic ophthalmia of horses and equine influenza.

The many theories of the etiology of periodic ophthalmia were thoroughly explored and it was concluded that heredity, bacterial and virus infections, and helminth infestation were of no significance. Extensive nutritional studies revealed that riboflavin was a nutritional factor involved and that supplementation of the feed ration with riboflavin was an effective means for the prevention of the disease.

Equine influenza was studied with the primary objective of developing means of prevention of morbidity and mortality of this disease in Army animals. The virus of equine influenza was found to be antigenically distinct from the viruses of human influenza, swine influenza, and canine distemper. Of prime importance was the discovery that the virus could be attenuated and that such a strain could be used as a vaccine to produce a mild and harmless disease which was followed by solid immunity.

This laboratory, at the direction of the Surgeon General, and in coöperation with the Rockefeller Foundation, endeavored to transmit infectious serum jaundice of man to horses. Yellow fever vaccines suspected of having caused the disease in man were em-



ployed. The experiment was discontinued when it was found that horses were not susceptible to the virus.

The establishment of a War Dog Reception and Training Center at the Front Royal Quartermaster Depot provided additional research problems for the Army Research Laboratory.

Canine leptospirosis presented a particular public health problem in that this disease is transmissible from infected dogs to man. An effective program for the control of this disease among Army war dogs was established by eliminating all dogs whose serum reacted to the plate agglutination test for leptospirosis.

The high incidence of *Dirofilaria immitis* in war dogs, serving in many parts of the United States and overseas presented a serious problem. Compound antimony has so far offered the greatest promise of treating infected animals. The study of the mechanism of the action of these compounds, their distribution in the body, and their toxicity have been of advantage in the treatment of filariasis in man.

#### CHEMICAL WARFARE SERVICE

Veterinary laboratory personnel were engaged in the study of the toxicological effects of chemical warfare agents on animals and in certain anti-biological warfare projects in connection with the protection of food supplies and the livestock industry.

Through coöperative studies made by the Chemical Warfare Service, the Medical Department and the Quartermaster Corps food was packaged in a manner that would minimize the chances of contamination in the event of chemical attack by the enemy. This method was more efficient and satisfactory than food decontamination measures. Further, a field service kit was developed for the rapid detection of toxic quantities of chemical contaminations of food.

Approximately twenty veterinarians

served in the Special Projects Division of the Chemical Warfare Service in the development of Biological Warfare including both the defensive and offensive phases. Certain of these findings will have a post-war application that will be of benefit to mankind.

Through the Joint United States-Canadian Commission and the Chemical Warfare Service, a War Disease Control Station was established on Grosse Isle, Province of Quebec, Canada, in 1942. The purpose of this project was to develop means by which the cattle of the North American continent could be protected against rinderpest if the disease should gain entrance. This project was staffed by six officers of the U. S. Army Veterinary Corps, one from the Medical Corps, U. S. Navy, and two scientists of the Canadian Army.

Rinderpest, a rapidly spreading virus disease, was at that time nonexistent in the Western Hemisphere and rigid quarantine and safety procedures were enforced to confine the disease to the experimental area.

The first objective of the Grosse Isle group was to prepare an adequate supply of tissue vaccine, according to methods previously developed, which could be used to provide a ring of immunized animals around an epizootic area. The second objective was to investigate the possibility of developing an efficient vaccine that could be produced without the use of a large number of animals.

After completing their first objective, they developed an attenuated rinderpest vaccine from virus in embryonated eggs that would produce a solid and lasting immunity in cattle. The dried vaccine, packed in vacuum, will maintain its potency for as long as 15 months, when stored at a temperature of 2 to 5°C.

The avianized vaccine is now being extensively tested in one of the countries where the disease is enzootic. It has proved to be so attenuated that only

mild and negligible reactions are produced in native cattle which are more highly susceptible to the disease than European breeds.

#### PAN AMERICAN SANITARY BUREAU

Foreseeing the possible spread of serious animal contagions as a result of increased animal traffic on the new projected Pan American Highway which is routed from the United States through Mexico and the Central American countries, the officials of the Pan American Sanitary Bureau instigated an Army veterinary survey of the animal diseases in the Central American countries.

This constituted the first comprehensive study of the diseases of animals in this area. Suggestions were made to the representatives of these governments for improvement of animal livestock industries and for the sanitary control of animal diseases.

As a result of this investigation it was found that international sanitary control of animal diseases was of paramount importance to the success of the Pan American Highway as an overland route.

#### SURVEY OF MILK SUPPLY AT AN ADVANCED AMERICAN BASE

Due to the prevalence of undulant fever in the civilian population on an island in the Atlantic Ocean where American troops were based, an Army veterinarian was detailed in December, 1941, to make a survey of the milk supply.

It was found that the incidence of brucellosis in the dairy cattle was approximately 51.4 per cent and that less than one-half of the milk supply was pasteurized.

A calfhood vaccination program was initiated using the U. S. Department of Agriculture's Strain 19 avirulent culture of *Brucella abortus* to protect the cattle breeding industry against abortions. An adequate inspectional sys-

tem was set up for the sanitary control of dairy farms and milk plants. Compulsory pasteurization of all milk was instituted after an additional pasteurizing plant was installed to meet the increased needs.

No additional cases of undulant fever have been reported since the carrying out of this program.

#### ICELAND BASE COMMAND

With the approval and material assistance of the officials of the Government of Iceland, Army Veterinary Corps officers pioneered a veterinary laboratory in that country late in 1941. During the succeeding two years they contributed a most important public health service in improving the milk supply of Iceland, and in the fields of animal husbandry and veterinary research in connection with diseases prevalent in Icelandic domestic animals.

#### VETERINARY LABORATORY SERVICE WITH ALLIED MILITARY GOVERNMENT IN EUROPE

Following the invasion and subsequent occupation of Germany, Army Veterinary Corps officers investigated and assumed technical responsibility for the control of biologic production at the I. G. Farbenindustrie Behringwerke, Marburg, Germany. The animal colonies of this plant included approximately 1,600 horses, 138 calves, 165 sheep, 3 goats, 10 swine, and 1,800 rabbits. As of June, 1945, this establishment was reportedly producing 150 per cent over the pre-war level.

In Italy the main concern was the rehabilitation and recovery of the eleven government-owned and controlled, and three privately owned laboratories which had produced biologics for the prevention and treatment of animal diseases. To reactivate these laboratories it was necessary to furnish them various types of equipment and supplies, and large and small laboratory animals.

THE ARMY VETERINARY SCHOOL, ARMY MEDICAL CENTER, WASHINGTON, D. C.

In October, 1923, the Division of Laboratories, Army Veterinary School, was moved to its present location to become an integral part of the Army Medical Center which was established September 1, 1923. Prior to the war, in addition to its manufacture of biologics and research activities, it handled routine Army veterinary laboratory activities for the greater part of the United States. With the establishment of the nine Service Command laboratories in 1941, it took over the veterinary laboratory activities for the Third Service Command and in addition functioned as a control laboratory. The latter duties included the study of subcultures of all organisms associated with outbreaks of animal diseases investigated in service command laboratories, and coöperation with Service Command and industrial laboratories in the standardization of laboratory methods for the chemical and bacteriological examination of foods of animal origin.

Beginning in December, 1940, and throughout the emergency period, it conducted special graduate courses in clinical pathology for veterinary officers and courses for enlisted veterinary laboratory technicians. Thirty-nine veterinary officers completed the course in clinical pathology.

During the war period the Division of Veterinary Laboratories produced the following biologics for the entire Army: equine encephalomyelitis vaccine, both animal and human, infectious abortion bacterin, mallein, tuberculin, infectious abortion antigen, glanders antigen and *Brucella* antigens of both plate and tube types. It also prepared the following positive sera for complement-fixation and agglutination tests: glanders, equine infectious abortion, trypanosomiasis, and contagious abortion.

Since 1939 these laboratories have manufactured the chick embryo type

equine encephalomyelitis vaccine used annually to immunize all Army horses and mules. Since the inauguration of this program no properly vaccinated Army animal has contracted encephalomyelitis. In addition to improving the method for the preparation of this highly potent horse type vaccine, a vaccine has been perfected for use in human beings which contains only one-tenth of inert chick tissues present in the horse type vaccine.

Methods for the mass production of more purified and concentrated typhus vaccines prepared from infected yolk sacs of embryonated hens' eggs were studied in coöperation with members of the Virus and Rickettsial Laboratory, Army Medical School. This project was begun on August 14, 1942, and the innovations and findings that resulted were included in a special report which was submitted on November 18, 1942.

Methods for the freezing and storing of milk in the frozen state which renders it acceptable for use on thawing have been studied and the findings have been the subject of two papers that have been submitted for publication.

In 1941 the Eastern type equine encephalomyelitis virus was isolated at the Army Veterinary School from horse brain material originating in Texas. Previously, only the Western type virus had been known to exist west of the Appalachian Mountains—Alabama line, and in October, 1943, the Venezuelan type of equine encephalomyelitis virus was isolated from two fatal human cases which occurred in Trinidad. This was the first recorded instance of natural infection of man with this type virus, resulting in a fatal infection.

These laboratories also made the analyses for protein, fat, carbohydrates, and moisture of foodstuffs employed in the Army Medical School Project M 11-1 entitled "Nutritive Value of Expeditionary Ration."

Japanese B encephalitis vaccine of

chick embryo type was produced for the first time by mass production methods in these laboratories during the last five months of the fiscal year 1946. This project was in collaboration with the Division of Virus and Rickettsial Diseases, Army Medical School. The field trials of this chick embryo type vaccine were made during the past summer in Japan and Okinawa.

#### CONCLUSION

The fact that no serious outbreaks of

food-borne diseases occurred among our troops, and not a single serious epizootic among the thousands of horses, mules, dogs, and pigeons employed in military operations, was in no small part due to veterinary laboratory activities.

Further, laboratory research contributed methods for the control of exotic animal plagues, had they accidentally gained entrance to our continent, or had they been introduced intentionally as a means of biological warfare.

---

## Devastated Library Needs

The American Book Center for War Devastated Libraries (Library of Congress, Washington, D. C.) recently issued a report of the first year of operation. The gist of it is to thank the 950 institutions and 2,800 individuals who have contributed books and periodicals, and the 25 agencies that have given more than \$100,000 in cash. It has thus been possible to ship nearly a million volumes of books, periodicals, and pamphlets to libraries in 34 foreign countries.

A few facts about the program: The Library of Congress has furnished space for the operation of preparing shipments for overseas which has required a staff of 30. Twenty-six per cent of the publications shipped were in the general

field of medicine, another 13 per cent in science other than medicine. Ten to 15 per cent of all volumes received at the shipping center have been discarded as of insufficient worth to justify shipping. Geographically every part of the country is represented in contributions but the American Book Center reports especially heavy contributions, considering their respective library resources, from Tennessee, North Carolina, Massachusetts, and California.

One last word: the need is still great and ABC suggests that America "cannot ignore its profound obligation to use its riches for the rebuilding of those physical and cultural institutions which were so grievously damaged by the war."

# Wartime Army Medical Laboratory Activities

## The Routine Virus and Rickettsial Diagnostic Laboratory \*

HARRY PLOTZ, M.D.†

*Formerly Chief, Division of Virus and Rickettsial Diseases, Army Medical School, Washington, D. C.*

DURING the War years the Army developed a laboratory service for the diagnosis of virus and rickettsial diseases which was unique in military medicine. Indeed, this represented the first attempt either in military or civilian medicine to provide such a broad coverage for the diagnosis of diseases which are of tremendous importance to medicine in general. The service was developed from a small nucleus at the Army Medical School which gradually increased in size and then spread to include other laboratories in the Armies throughout the world. While the Division of Virus and Rickettsial Diseases at the Army Medical School remained the central reference laboratory for all diagnostic work performed during the war years, each Theater of Operations (European, Mediterranean, CBI, and Pacific) had laboratories which performed certain diagnostic tests for the troops in its command. Furthermore, as the Army expanded in the United States certain of the diagnostic functions were taken over by a few of the Service Command laboratories, such as those of the Fourth, Eighth, and Ninth Command areas.

Not only was the principle of a general routine diagnostic service for virus and rickettsial diseases new, but also many of the methods and materials used for this type of work were in the developmental stage when the laboratory at the Army Medical School began to function in January, 1941. A number of diagnostic procedures for important diseases had to be evaluated or developed as the war progressed. Even those tests which were sufficiently well standardized for immediate adoption required materials which were not available elsewhere. Therefore, these had to be manufactured at the Army Medical School. Eventually it was possible for some of the Medical General and Service Command Laboratories to make some of the necessary antigens and antisera, but certain of the required materials were supplied to them by the Division of Virus and Rickettsial Diseases of the Army Medical School.

An idea of the extent of the serological diagnostic work performed at the Army Medical School is evident from the following list of diseases which were under consideration. Among the neurotropic virus diseases were lymphocytic choriomeningitis, Eastern, Western, St. Louis, Japanese B, Russian spring and summer, West Nile, and herpes encephalitis. Other virus diseases examined were influenza, atypical pneumonia, mumps, and those due to the

\* Presented before the Laboratory Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 14, 1946.

† Died January 6, 1947.

lymphogranuloma venereum-psittacosis group of agents. In the rickettsial field, specific complement-fixation and rickettsial agglutination tests were regularly performed for epidemic and murine typhus, Rocky Mountain spotted fever, Q fever, and on occasion for the less common rickettsial diseases. Besides these serological tests, attempt at strain isolation and identification was made in many of the above diseases.

Before the Laboratory could provide useful service to medical officers in the field, it was necessary to define the problems pertaining to virus and rickettsial diseases, to teach the value of diagnostic procedures, and to describe the necessary information regarding the collecting and shipping of materials for study. This was accomplished in two ways: Circular letters, containing the necessary information, were prepared and widely circulated by the Surgeon General's Office. Training, by means of lectures and demonstrations, was provided to some 2,000 officers in the course in tropical medicine given at the Army Medical School.

It was not only important to train doctors in the value of the diagnostic services available, but in addition it was necessary to train laboratory personnel, both technical and professional, to perform the required work. Before the war, relatively few scientific workers had experience in this field and very few of these became available to the Army. The extent of the laboratory training program is evident from the fact that practically all of the officers in the Army at the close of the war who performed virus and rickettsial work had received some period of training at the Army Medical School.

Investigation was actively associated with the diagnostic laboratory. In this manner diagnostic methods were studied and evaluated and new techniques were devised. This is illustrated in the work of a number of our Army laboratories.

The Fifth and Ninth Service Command Laboratories in the United States and the First Medical General Laboratory in Europe, as well as the Eighteenth Medical General Laboratory in Hawaii, contributed to our knowledge of influenza. Investigations on epidemic and scrub typhus were followed in the First Medical General Laboratory and the Nineteenth Medical General Laboratory. Extensive studies on hepatitis were carried out in the Fifteenth Medical General Laboratory where, in addition, significant contributions to our knowledge of Q fever were obtained.

Some of the more important results of investigations carried out at the Army Medical School were as follows. Specific serological tests for the diagnosis of a number of rickettsial infections of man were developed in the Division of Virus and Rickettsial Diseases. Although the techniques for the identification of infections with epidemic and murine typhus were the most important from a military point of view, those for Rocky Mountain spotted fever, boutonneuse fever, and South African tick bite fever were also valuable. The tests for typhus fever which were developed in this Division became standard diagnostic procedures used throughout the Army and by the members of the United States of America Typhus Commission. Furthermore, they have proved extremely useful for survey purposes in determining the type of typhus prevalent in a given area. In addition to information of direct military importance obtained from such studies, the Division conducted surveys in Latin America in coöperation with the Office of Inter-American Affairs which enhanced our knowledge of the type of typhus found in several countries.

While no entirely new diagnostic methods for the virus diseases were developed in the Division, a number of the existing methods were improved and standardized. These included serologic

tests for the lymphogranuloma venereum-psittacosis group of agents, for the various members of the group of neurotropic viruses, for the influenza viruses, and for the mumps virus. Valuable information on the occurrence of these infections in Army personnel was obtained by application of these methods.

Preventive measures have dealt principally with the development of vaccines for immunization against epidemic and scrub typhus and Japanese encephalitis, all of which are of great military importance. In addition, significant advances have been made in the study of chemotherapeutic agents active against rickettsiae.

Early in 1941 the Division emphasized the inadequacy of the typhus vaccine then employed by the Army. As a result of comparative studies with various types of vaccine, the need was pointed out for increasing the concentration of antigenic materials in the vaccine to be used by our troops. In constant close contact with other laboratories engaged in this problem, the Division contributed to the development of a typhus vaccine rich in rickettsiae and soluble antigen. This product was adopted by the Army late in 1942; but not until 1944 had sufficient evidence accumulated to indicate that the new vaccine, plus other control measures, was adequate to protect an army operating in a typhus infected area. During this interval the Division continued to study means of improving the typhus vaccine adopted in 1942. All of our troops overseas were immunized and, while a few mild cases of epidemic typhus occurred in these immunized individuals, not a single American soldier died of epidemic typhus fever during World War II.

As epidemic typhus decreased in importance to the American armies, scrub typhus assumed increasing significance. During the summer of 1944

potent vaccines were prepared both here and elsewhere. None of the methods were well suited to large-scale commercial manufacture and the war ended before any of the three types of vaccine was given an adequate field trial.

In the Pacific Theater, Japanese B encephalitis has affected our troops and may continue to be a problem during the period of occupation. A vaccine against this disease, prepared from embryonated eggs, has been developed recently in the Division.

As a result of the war experience in the Division of Virus and Rickettsial Diseases, a number of facts of general importance have been learned:

1. It is evident that medical training in our schools has been notably deficient in the clinical teaching of virus and rickettsial diseases. Greater emphasis must be placed on this important group of infectious diseases by our universities.
2. The diagnostic procedures now employed for virus and rickettsial diseases have reached the stage of development where they can in many instances be employed by competent bacteriological and serological laboratories associated with universities and public health organizations. The training of personnel in these methods is essential. The dissemination of information and the application by civilian laboratories is to be encouraged.
3. Diagnostic work for the virus and rickettsial diseases is still expensive, both as regards time and money, and requires personnel and equipment which should be devoted, at least in part, to investigative work in these fields. It has been pointed out that each of the Army laboratories doing virus and rickettsial work combined diagnosis and research. This combination is to be encouraged. Indeed, it is essential for the advancement of knowledge in this important field.
4. The experience of all of the lab-

oratories doing this type of work has been that one of the main difficulties centers around obtaining the proper specimens for diagnostic tests and their transportation in a satisfactory manner. This can be accomplished by an educational program. The principles which should be employed have been learned and applied on a large scale in the Army and the experience is available to others.

5. The continuous active enthusiastic

support of the program of diagnosis and investigation of virus and rickettsial diseases by the Army has indicated the usefulness of such medical service to a military organization. A number of universities and public health organizations have begun plans for providing diagnostic facilities for virus and rickettsial diseases, along the lines developed by the Army. These efforts should be encouraged in every way possible.

---

## Attention: Sanitary Corps Officers

A history of the Sanitary Corps during the last war is being compiled by Colonel M. J. Blew, Sn.C. Colonel Blew has volunteered his services in preparing a record of the accomplishment of the Corps. All former Sanitary Corps officers, including those still on active duty, are asked to communicate with Colonel Blew giving their rank, date called to active duty, and date of separation, present rank or rank on separation, specialty in the Corps

(engineering, entomology, parasitology, bacteriology, chemistry, nutrition, etc.), a résumé of pertinent facts regarding active duty assignments, awards or commendations, academic and professional degrees, professional and honorary society affiliations, and state of registration or certification.

Material should be sent to Colonel M. J. Blew, Sn.C., National Society of Professional Engineers, 1359 Connecticut Ave., N.W., Washington 6, D. C.



# Wartime Army Medical Laboratory Activities

## Development of *Shigella* Typing by Antigenic Analysis \*

PHILIP R. CARLQUIST, MAJOR, PC, U.S.A.

*Division of Bacteriology, Army Medical School, Washington, D. C.*

UNTIL the work of Andrewes and Inman,<sup>1</sup> and Gettings<sup>2</sup> with the mannitol-fermenting organisms of the genus *Shigella* demonstrated antigenic differences within groups having the same biological pattern, it had been the custom to recognize species within the genus by the determination of their physiological characteristics only. The scheme established by Andrewes and Inman<sup>1</sup> was based on the recognition of four antigenic components of the Flexner group which permitted the differentiation of five races and two sub-races. This fundamental concept gained wide acceptance and was not challenged until Boyd<sup>3-6</sup> determined the presence of six fractions of group antigenic components which were common to members of the Flexner group, and established the presence of other antigenic components which were type-specific. He also established six additional races, characterized only by type-specific antigen. Wheeler<sup>7</sup> was unable to identify all the group antigenic components suggested by Boyd, but confirmed his work on the type-specific antigens. Weil, Black, and Farsetta<sup>8</sup> proposed a new classification of the Flexner group of organisms based upon an analysis of major antigenic com-

ponents. This suggestion needs further investigation before it can be accepted as valid by the Army.

Recognizing the limitations encountered in the differentiation of these organisms through physiological study, the Division of Bacteriology of the Army Medical School began developing sera for the identification of members of the *Shigella* group in the early part of 1943. It was decided to prepare suitably absorbed sera for the slide agglutination technic as suggested by Wheeler.<sup>9</sup> To supply the needs of all Army installations in the United States and the overseas theaters, it was essential to produce and absorb large volumes of sera. Previous experience had shown the necessity of producing four times the amount determined essential for each installation to make up for storage and loss in shipping.

Cultures from many collections and other sources were studied for conformance with the antigenic patterns recognized as standard. Each culture was lyophilized as soon as it was received at the Army Medical School in order to avoid changes in antigenic structure which might develop through serial transfer on culture media. Strains capable of producing high agglutinin titers were then utilized for the immunization of rabbits. All such cultures were harvested after less than 18 hours' incubation. Our experience has demon-

\* Presented before the Laboratory Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 14, 1946.

strated that cultures over 18 hours old produce sera which contain increased quantities of nonspecific agglutinins. When trial bleedings demonstrated that the maximum development of agglutinins had occurred, the rabbits were exsanguinated. All concentrated sera were preserved in merthiolate (1:5,000) and allowed to "stabilize" at 5° C. for one month before absorption procedures were begun. These were carried out using dried *Shigellae* as the absorbing suspension.

In order to secure adequate quantities of absorbing organisms for such large volumes of sera, mass cultures in liquid medium were made. The medium for mass culture was dispensed in 33 liter lots and consisted of nicotinamide and calcium pantothenate as growth factors added to a 5 per cent dextrose, 2 per cent tryptose broth. The inoculum was prepared from a lyophilized culture of the desired strain which had been activated by a 24 hour incubation in 0.5 ml. veal infusion broth. A 1,000 ml. culture in tryptose broth, in the log phase of growth was used as the inoculum for the carboy. During the processing of the inoculum, continual purity checks were made. The carboy culture was incubated 18 hours with constant aeration and stirring. At appropriate intervals 5N-Na OH was added to maintain the pH at 7.4. The mass culture was heat-killed at 60° C. for 30 minutes, harvested with a Sharples centrifuge at 50,000 r.p.m., and resuspended in saline. This suspension was washed and reprecipitated with several volumes of acetone, after which it was dried, weighed, and stored at 5° C. until used. Yields were usually 50-60 gm. of dehydrated bacterial substance per 33 liter mass culture.

A scheme for the absorption of each antiserum was determined by the preliminary testing of a 1-10 dilution of the unabsorbed antiserum against at least one representative strain of each

known *Shigella* type, race, or variant. Antigens used to determine this pattern, as well as others used throughout the absorption, were live organisms washed from 18 hour slants in 2 ml. physiological saline. Results were not reliable when organisms were incubated for periods longer than 18 hours. Large glass plates, thoroughly cleansed and blocked off into small rectangular boxes with a soft wax pencil provided a stage on which many tests could be set up at the same time. The test was made by transferring a drop of antigen and a slightly larger drop of antiserum to a box on the slide. The slide was gently rocked for 5 minutes, and the agglutinations were read by transmitted light as strong, weak, or absent.

To conserve sera all trial absorptions were conducted on a micro scale. The primary absorption was carried out for the removal of the group components of the Flexner races.

A typical absorption was begun by weighing out 10 mg. of dried organisms (usually Flexner X or Y). These were suspended in 2 ml. of physiological saline, dispensed into micro tubes in 0.5, 0.4, 0.3, 0.2 and 0.1 ml. quantities and centrifugalized. After removal of the supernatant saline, 0.25 ml. of test antiserum was added to the sediment in each tube, thoroughly mixed, and immediately recentrifugalized. From this, the number of mg. per ml. necessary to remove the group agglutinins could be readily determined. If the quantity used was insufficient for complete removal of the cross-reacting antibodies, the procedure was repeated using increasing amounts (up to 100 mg.) of dried organisms until it was evident that no agglutinins for that particular organisms were present. Five to 10 ml. of antiserum, absorbed according to the above calculation was prepared at this point and absorption of the remaining nonspecific agglutinins was continued on the micro scale.

## ARMY MEDICAL SCHOOL

Diagnostic Agglutinating Sera for the Genus *Shigella*

Present Army Nomenclature	Proposed Boyd Nomenclature	Sera Present in Comprehensive Shigella typing kit	Sera Present in small Shigella typing kit	Reactions of Polyvalent sera A, B and C present in both kits		
				A*	B	C
<i>Sh paradysenteriae</i> , V	Flexner I	+	Trivalent VWZ serum	+	+or-	+or-
" " W	" II	+		+	+or-	+or-
" " Z	" III	+		+	+or-	+or-
" " Boyd 103	" IV	+	+	+	+or-	+or-
" " " P119	" V	+		+	+or-	+or-
" " " 88	" VI	+		+	+or-	+or-
" sonnei (smooth)		+	+	+	+or-	+or-
" " (rough)		+		+	+or-	+or-
" rabaulensis				+	+or-	+or-
" paradysenteriae, Boyd 170	Boyd I	+		-	+	+or-
" " " P288	" II	+		-	+	+or-
" " " D1	" III	+		-	+	+or-
" " " P274		+		-	+	+or-
" " " D19		+		-	+	+or-
" " " P143		+		-	+	+or-
" dysenteriae, (Shiga's bacillus)		+	+	-	-	+
" ambigua, (Schmitz' bacillus)		+	+	-	-	+
" sp. Sachs Q771 (arabinotarda A)		+		-	-	+
" " " Q902				-	-	-
" " " Q1030				-	-	-
" " " Q1167 (arabinotarda B)				-	-	-
" " " Q454				-	-	-
" " Lavington (etousae)				-	-	-
" alkalescens, type I			+	(-)**	(-)	(-)
" " " II				(-)**	(-)	(-)
" madampensis				(-)**	+or-	(-)
" ceylonensis				(-)**	(-)	(-)

\*\* Usually negative Requires heat to produce agglutination

\* Non-specific (e.g. types X and Y) and rough strains usually agglutinate in Polyvalent A serum but not in the specific sera.

Many types were used to produce a specific serum. All trial absorptions were carefully controlled by testing with the homologous antigen to deter-

mine loss of type-specific components. The absorption formula was then checked on 5 ml. of 1:10 antiserum. Large lots of antisera were prepared

from the formula finally established by micro technic. Each lot of absorbed serum was tested against all *Shigella* organisms in the Army Medical School collection to determine its specificity and to rule out cross-reactions which might not have appeared in the preliminary testing. This final battery of antigens was composed of 360 strains of *Shigellae* representing every race, variant, and species available from all sources. Titers were established by checking a serum against all the homologous strains in the collection and using the weakest reaction as the maximal point. The actual titer of a serum was determined as the dilution two steps less than the maximum to compensate for deterioration and dilution. If preliminary titrations carried out in geometric progression indicated a titer of less than 1:80, the titration was repeated arithmetically with a common difference of 10. If the highest agglutination was 1:70, the dilution for use was 1:60 and the serum was bottled at 1:30. Such titers are of interest because they effected the conservation of sera. The sera distributed to Army installations for routine diagnostic tests were standardized to be effective when diluted with an equal volume of saline.

The components of the polyvalent sera were determined by the frequency of their occurrence as well as by their antigenic relationships. Flexner races, V, W, and Z, *Sh. sonnei*, and Boyd's 103, P119, and 88 were placed in group A, the remaining Boyd species in group B, and the rarer species, *Sh. dysenteriae*, *Sh. ambigua* and *Sachs Q771*, in group C. Cross-reactions were first absorbed from each component serum. Component sera were then pooled in appropriate proportions to bring about the agglutination of all organisms included in the group. Cross-reactions detected in the final testing were absorbed from the pooled lot. Whenever the reactions

were weak against one of the antigens, additional homologous serum was added until adequate agglutination occurred. All absorbed sera were preserved with 1-10,000 sodium merthiolate and were sufficiently potent to agglutinate specific organisms within 5 minutes when the slide agglutination test was used.

Although the components of the polyvalent sera were primarily selected on a basis of frequency, it should be noted that they followed accepted antigenic patterns. Polyvalent A serum agglutinated *Sh. flexneri* I to VI in Boyd's scheme, as well as all *Sh. sonnei* strains. Polyvalent C serum agglutinated the more common strains not identified with sera A or B. Thirty-one sera were produced for inclusion in the kits as outlined in the table.

Three types of kits were prepared for distribution. A simplified kit, supplied to general hospitals, regional station or station hospitals upon request, contained the three polyvalent sera, a trivalent serum for *Sh. paradysenteriae* Flexner V, W, and Z, and monovalent sera for Boyd 88, *Sh. sonnei*, *Sh. dysenteriae*, and *Sh. ambigua*. The polyvalent sera served as a screen before further differentiation was attempted. An organism positive in the polyvalent A serum could be tested in the trivalent VWZ, Boyd 88 and *Sh. sonnei* sera; if it was positive in polyvalent B serum no further breakdown was possible with this kit, but if it was positive in polyvalent C serum, it could be checked against both *Sh. dysenteriae* and *Sh. ambigua*.

A second and more complete kit was supplied to all Army Area Laboratories, to large general laboratories in overseas theaters and to certain other installations whose investigation work required a larger number of monovalent sera. This kit, in addition to all sera in the simplified kit, contained monovalent sera for the Flexner paradysenteriae V, W, and Z, Boyd's

103, P119, 170, P288, D1, P274, D19, and P143, *Sh. alkalescens* and *Sh. sonnei* (rough).

A third kit was available upon request to holders of the complete kit. This kit was composed of eight monovalent sera and included Sachs Q771, Q902, Q1030, Q1167, and Q454, *Sh. alkalescens*, type II, *Sh. madampensis*, and *Sh. ceylonensis*.

All individual sera were issued in glass vials with screw caps. Dropper assemblies were included for each vial to facilitate the dispensing of sera. Experience has shown that 1 ml. of serum, diluted with an equal volume of physiological saline, was sufficient for more than 100 tests. Instruction sheets describing the preparation of antigens and sera, the technic and interpretation of the tests, accompanied each kit.

In the production and absorption of these sera many interesting problems evolved and many avenues of future investigation were opened. It was discovered early in the work that *Sh. alkalescens* antiserum failed to agglutinate homologous organisms by the slide technic although it consistently agglutinated them through high titer when incubated in test tubes overnight. It was found that *Sh. alkalescens* contains a heat-labile component which prevents agglutination by the slide technic. This difficulty was overcome by boiling all *Sh. alkalescens* antigens for  $\frac{1}{2}$  hour. Later it was discovered that the antigens for *Sh. alkalescens*, type II, *Sh. ceylonensis* and *Sh. madampensis* must be treated in the same manner. The practical problem had been solved, but the question of the relationship of this factor to others vital in understanding the antigenic structure of these organisms remains unanswered. If there are heat-labile components there may well be others which can be neutralized or inactivated by organic or inorganic substances to produce better sera.

The question of the validity of Flexner races X and Y as proposed by Andrewes and Inman arises frequently. According to Boyd, the Y strain exists only in the form of old laboratory strains which have lost the type-specific factors. Ten strains which appeared to be authentic Y types were received in July, 1945, from an outbreak of dysentery at Camp Wheeler, Georgia. These identifications were confirmed by other investigators. An antiserum was developed which subsequently agglutinated seven additional organisms in our unidentified collection. It seems probable that the Y group will have to be reinstated as a valid race although for the present it is considered only in experimental studies at the Army Medical School. A strong cross-reaction exists between the authentic Y types and the organism designated *Sh. rabaulensis*, by Barnes, Wheeler, and Dammin,<sup>10</sup> a type isolated and established as an authentic species from clinical cases of dysentery in Rabaul.<sup>11</sup> Our isolates came from clinical cases in Puerto Rico. The Y agglutinins in *Sh. rabaulensis* antiserum cannot be completely absorbed and yet there is some evidence to indicate that they are separate and distinct entities.

The strong antigenic relationships between some strains of *Sh. sonnei* in the "rough" (phase II), the D-19 of Boyd, and the Q1030 of Sachs is an example of one of the questions that must be answered before the production of specific monovalent sera can be considered complete. Other similar problems require further investigation but it is felt that the preparation of absorbed monovalent sera represents a great advance. Many thousand strains of *Shigellae* and *Shigella*-like organisms have been received at the Army Medical School, and less than 50 remain unidentified when studied with these sera. These strains are being studied and it may be found possible to establish

some new serotypes within the genus.

It is felt that control of bacillary dysentery in the Army has been helped by the development of sera which enable one to make an etiologic diagnosis within 48 hours. This makes possible an early study of the epidemiology so that necessary steps can be taken early to eliminate sources of infection.

ACKNOWLEDGMENT—This program was initiated under the direction of Dr. C. V. Seastone and Dr. K. S. Wilcox.

#### REFERENCES

1. Andrewes, F. W., and Inman, A. C. A Study of the Serological Races of the Flexner Group of Dysentery Bacilli. *Spec. Rep. Ser. No. 42*. Med. Res. Council, London, 1919.
2. Gettings, H. S. An Investigation of the Flexner—Y Group of Dysentery Bacilli. *Spec. Rep. Ser. No. 30*. Med. Res. Council, London, 1919.
3. Boyd, J. S. K. Some Investigations into So-called "Non-agglutinable" Dysentery Bacilli. *J. Roy. Army M. Corps*, 57:161-186 (Sept.), 1931.
4. Boyd, J. S. K. Further Investigations into Characters and Classification of Mannite-fermenting Dysentery Bacilli. *J. Roy. Army M. Corps*, 59:241 (Oct.); 331 (Nov.), 1932.
5. Boyd, J. S. K. Review of Dysentery Bacilli of India, with Special Reference to Certain Recently Described Types. *J. Roy. Army M. Corps*, 66:1-13 (Jan.), 1936.
6. Boyd, J. S. K. The Antigenic Structure of the Mannitol Fermenting Group of Dysentery Bacilli. *J. Hyg.*, 38:477-499 (July), 1938.
7. Wheeler, K. M. Antigenic Relationships of *Shigella paradysenteriae*. *J. Immunol.*, 48:87-101 (Feb.), 1944.
8. Weil, A. J., Black, J., and Farsetta, K. Serological Types of *Shigella paradysenteriae* (Flexner): Types with Single Primary Antigen. *J. Immunol.*, 49:321-34 (Dec.), 1944.
9. Wheeler, K. M. Serological Identification of the Dysentery Bacilli. *A.J.P.H.*, 34:621-629 (June), 1944.
10. Barnes, L. A., Wheeler, K. M., and Dammin, G. J. Personal communication.
11. *Reports to Council of the League of Nations on the Administration of the Territory of New Guinea, 1938-39*. p. 60, Commonwealth of Australia, 1940.

## Norton Medical Award Changed

The revised terms of the annual Norton Medical Award for book manuscripts written for the lay public by professional workers in the field of medicine have recently been announced by W. W. Norton & Co. There is now no final closing date for the submission of manuscripts and the Award is now not limited to any one year.

Instead of an outright cash grant of \$3,500, an award of \$5,000 is now offered as a guaranteed advance against royalties. Either complete manuscripts or detailed table of contents together with one hundred pages of manuscript may be submitted. Full details may be secured from W. W. Norton & Co. Inc., 101 Fifth Avenue, New York 3, N. Y.

# The Common Rat as a Source of *Erysipelothrix rhusiopathiae*

CHARLES H. DRAKE, PH.D., AND ELIZABETH R. HALL, M.S.

*Department of Bacteriology and Public Health, Washington State College,  
Pullman, Wash.*

THE rôle of the common rat (*Rattus norvegicus*) in the spread of disease is too well known to require further emphasis. However, it should be pointed out that the rat may be an easily overlooked source of some pathogenic organisms not usually associated with rodents.

The authors recently conducted a rat survey in a small section of southeastern Washington in an effort to determine whether the animals were carriers of *Leptospira icterohaemorrhagiae* and therefore a potential source of human cases of Weil's disease. Unfortunately, local circumstances brought a halt to the work after 85 rats had been examined by one or more of the following methods: kidney culture, kidney sections, animal transmission, agglutination tests, and dark-field examination of diluted ground kidney. As many as possible of the methods were used on each animal, but since the rats were collected by trapping and shooting, there were some cases in which blood was not available for agglutination tests and often the animals were not suitable for cultural examination. No evidence was found which indicated the presence of *Leptospira* in local rats but several interesting incidental observations were made.

Whenever possible a white Swiss mouse was injected with kidney, liver and spleen tissue from each rat. Tissue injections from two different rats caused death of the experimental mice within a

week and further transmission and cultural examination led to the isolation of *Salmonella enteritidis*\* from one and *Erysipelothrix rhusiopathiae* from the second animal. Neither of the source rats showed any gross lesions at autopsy and both appeared normal at the time of capture.

The strain of *E. rhusiopathiae* was identified by its morphology, cultural reactions, animal pathogenicity, and by agglutination and protective tests with commercial swine erysipelas antiserum.

Intraperitoneal injection of 0.1 ml. of a broth culture killed mice in 48 to 96 hours with characteristic symptoms, including conjunctivitis, and the organism was readily reisolated from the mice. The organisms were easily demonstrated by strained smears or by dark-field examination of blood from the mice 24 hours after infection.

Both slide and tube agglutination tests were set up with commercial swine erysipelas antiserum, and the culture was isolated from the rat. A control series consisting of a known strain of *E. rhusiopathiae* was tested against the serum at the same time. The organism from the rat gave a positive reaction at a dilution of 1-1,280 by both tests while the known strain gave a complete reaction only at a dilution of 1-640. The difference may be due to the fact that

\* The authors would like to express appreciation for the assistance of Dr. P. R. Edwards of the Salmonella Typing Station, University of Kentucky, for confirming our identification of this organism.

the known strain, obtained through the courtesy of the Washington State College School of Veterinary Medicine, had been carried for many transfers on artificial media.

The same serum was also used for protection tests on mice. Fifteen white Swiss mice weighing 17–20 gm. were injected intraperitoneally with 0.2 ml. of a 72 hour proteose peptone broth culture of *E. rhusiopathiae* isolated from the rat. Five of the mice were used as controls and all died by the fourth day. Five of the mice received an intraperitoneal injection of 0.5 ml. of a 1–10 dilution of antiserum. This dosage was insufficient to protect the animals completely but delayed death 24 to 48 hours as compared with the controls. The remaining five mice received 0.5 ml. of undiluted antiserum intraperitoneally; one mouse died on the sixth day but the others remained well and yielded no *E. rhusiopathiae* when killed and cultured six weeks later.

The cultural reactions of *E. rhusiopathiae* have been rather variable in the hands of different workers, as pointed out by Karlson and Merchant.<sup>1</sup> However, most authors agree that in ordinary fermentation media, acid, but no gas, is formed from glucose and lactose but no change is observed in sucrose and mannitol. These properties were shown by the organism isolated from the rat. A small amount of hydrogen sulfide was produced on Treece's medium, which agrees with most observations. Packer<sup>2</sup> reported that a medium containing 1 in 1,000 sodium azide and 1 in 100,000 crystal violet in a blood-agar base at pH 6.8 inhibited all organisms tested except *E. rhusiopathiae*. A proteose peptone agar base adjusted to pH 6.8 and containing the above concentrations of sodium azide and crystal violet supported growth of our strain for five serial transfers. The growth was distinct but of lesser amount

than on the same medium without the inhibitory substances. We have found that *E. rhusiopathiae* will also grow on media containing 1 in 2,000 potassium tellurite; appearing as small, dark colored colonies.

#### DISCUSSION

*E. rhusiopathiae* has been isolated from a wide variety of mammals, birds, and fish. Human infections are not rare and at times appear to be an occupational hazard. In view of this, it seems strange that the only previously recorded isolation of *E. rhusiopathiae* from rats was made recently by Stiles.<sup>3</sup> His observation differed from ours in that the infected rat was obviously diseased and partially disabled by the infection. This organism may be a more frequent parasite of rats than has been realized, and rodents may play an unrecognized rôle in its spread. In our case the evidence is insufficient to decide whether or not the rat was a healthy carrier or was in the prodromal stage of the disease at the time of capture. If this organism is more commonly associated with rats than has been recognized, it affords a possible explanation of the isolation of the bacterium from various materials in which a source of contamination has not been apparent. However, the growth of *E. rhusiopathiae* in the presence of substances inhibitory to most organisms (sodium azide, crystal violet, potassium tellurite) may be related to its apparent ability to survive for long periods in unfavorable materials.

#### SUMMARY

*Erysipelothrix rhusiopathiae* was isolated from an apparently normal rat captured during a leptospirosis survey. The organism was identified by animal pathogenicity, cultural reactions, agglutination tests, and by mouse protection tests with known antiserum. The ability of this organism to grow in the presence



of sufficient crystal violet and sodium azide to inhibit most other organisms has been confirmed. The organism was also found to grow in the presence of 1 in 2,000 potassium tellurite.

Attention is called to the possibility that rats may be an overlooked source of *E. rhusiopathiae* even though only one previous isolation has been reported from this animal. The present isolation differs from the one previously reported in that the animal showed no

symptoms or gross pathology of the disease although the possibility that it was in a prodromal stage of infection cannot be dismissed.

#### BIBLIOGRAPHY

1. Karlson, A. G., and Merchant, I. A. The Cultural and Biochemic Properties of *Erysipelothrix rhusiopathiae*. *Am. J. Vet. Res.*, 2:5, 1944.
2. Packer, R. A. The Use of Sodium Azide ( $\text{NaN}_3$ ) and Crystal Violet in a Selective Medium for Streptococci and *Erysipelothrix rhusiopathiae*. *J. Bact.*, 46:343, 1943.
3. Stiles, George W. Swine Erysipelas Organisms Recovered from a Brown Rat (*Rattus norvegicus*). *Am. J. Vet. Res.*, 5:243, 1944.

## Need for Federal Research Grants To Study Environmental Sanitation Problems

The following resolution was adopted at the joint meeting of the Great Lakes Board of Public Health Engineers and Upper Mississippi River Boards of Public Health Engineers at a meeting on February 6, 1947:

WHEREAS, the growing importance of environmental sanitation in the field of public health is recognized, and

WHEREAS, there are a number of environmental sanitation problems requiring further research and study to effect practical solutions, and

WHEREAS, a program for fundamental research and study of environmental sanitation problems through research grants has already been inaugurated by the U. S. Public Health Service, and

WHEREAS, even though the activities of this

program have been thus far limited, its value has been demonstrated.

THEREFORE, the Upper Mississippi River Board of Public Health Engineers and the Great Lakes Board of Public Health Engineers in joint meeting assembled February 6, 1947, in Chicago

RESOLVE that the value of this fundamental research in environmental sanitation through research grants is recognized, and recommend to the U. S. Public Health Service that additional appropriation be requested of Congress for such grants.

The Boards of Public Health Engineers were established under the Great Lakes Drainage Basin Sanitation Agreement and the Upper Mississippi River Drainage Basin Sanitation Agreement.

# Health Education in Mexico\*

MANUEL GONZÁLEZ RIVERA, M.D.

*Chief, Division of Health Education, Ministry of Public Health and Welfare,  
Mexico City, Mexico*

HEALTH Education in Mexico, as a governmental activity, was initiated on April 21, 1922, when the Section of Health Education and Propaganda was founded in the Public Health Department. From that time until 1940, health education activities were gradually increased and the Bureau of Health Education received increasing official recognitions, assuming successively the rank of "Section," "Office," "Department," and, in 1940, "General Direction."

Health education of the public has been accomplished by several means, such as by pamphlets, leaflets, posters, and other printed materials. Educational films began to be utilized and some endeavors were made to produce documental films. Talks and conferences given to school children, mothers, workmen, or unclassified groups, were numerous. Unfortunately this educational work was intensive only in and around Mexico City. In the rest of the country health propaganda was reduced to the meager distribution of a monthly publication and some printed materials, and to holding once a year a Week of Hygiene in the cities or towns in which there existed a Hygiene Center or Unit. At the beginning of the sexennium that we are going to review, the overall picture of health education only showed a more or less broad program in Mexico

City, and nothing important in the rest of the country.

Developments have occurred in two periods of time: from its beginning, in December, 1940, to October, 1943, when the Public Health Department and Ministry of Public Welfare were united to form the present Ministry of Public Health and Welfare. The second period includes three years, from October, 1943, to the present time.

In the first period the aims of health education were determined the educational work developed and was extended to the states and territories. Some attempts were made to introduce health education in the schools with the organization of school health committees integrated by the pupils, under the counsel and guidance of doctors and teachers.

At the beginning of the second period, when the Public Health Department and the Ministry of Welfare were blended to create the Ministry of Public Health and Welfare in 1943, noteworthy changes in the plans of health education took place. The Director of Health Education became a technical consultant for the services of public health in the whole country, through sections of health education founded in the capital of each of the states or territories.

In order to be able to put in execution the enlarged plans, the Division of Health Education has been divided into four sections, as follows:

1. Publicity and Propaganda

\* Presented before the Public Health Education Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 12, 1946.

2. Health Education Guidance
3. Health Exhibits
4. Mail Courses -

The first section, Publicity and Propaganda, is considered as a laboratory in which we elaborate different materials that are sent to the local health services in every state or territory, where doctors, nurses, and other public health workers make use of them. For personal or direct propaganda by spoken word, conferences or talks are prepared and mailed to doctors and nurses who are at work in Hygiene Centers or Units. Copies of various scripts, sketches, dialogues, etc., are sent to all radio stations, as well as records with electrically transcribed programs. Twice a week, we transmit through "Radio Continental" (1030 kc.), programs carried out by groups of doctors, social workers, clerks, etc., of our staff. "Radio Gobernación" (1060 kc.) broadcasts a weekly program performed by the boys and girls of primary schools. Straight health talks are seldom used; we consider the above cited ways of broadcasting more suitable to the needs and idiosyncrasies of our common people.

We have just begun to engrave records with simple and easily interpreted lessons in hygiene which will be broadcast three times a week for the children of primary schools through a radio station recently acquired by the Ministry of Public Education. Also in this section, printed materials are produced to be distributed by health organizations in the country: pamphlets, leaflets, booklets, posters, etc., on the subjects of smallpox, malaria, tuberculosis, venereal diseases, diphtheria, typhoid fever, nutrition, child health, sanitation, etc.

We are writing and editing a monthly publication whose title is "Salud" (Health). Each issue is wholly devoted to a single subject in such a manner that every edition is like a simple and

easily read monograph on typhus, malaria, alcoholism, school hygiene, nutrition, eugenics, dental hygiene, housing, etc.

Other periodical publications of the Ministry of Public Health and Welfare are the quarterly review of the Institute of Public Health and Tropical Diseases, scientific review of the Institute, edited by the Division of Health Education, and the house organ "Salubridad y Asistencia" published every other month.

In 1944 we began to make an almanac with various ephemerides concerning the history of medicine and hygiene. Most important in this almanac are short and pointed phrases, documental or instructional, inserted in a daily sheet and inserted in such a way that the reader receives from the beginning to the end of the year, a short course in hygiene. The almanac for 1945 was dedicated to "General Hygiene and Preventive Medicine"; the one for the present year is especially devoted to mothers and teachers and is an elementary treatise on child health. The calendar for the forthcoming year has just been prepared and will instruct the readers about the prophylactic measures against the chief communicable diseases in our country.

We have not neglected the great importance of the press as our effective ally in the health education of the people. We have a catalogue of all newspapers or reviews in the country and we frequently write for them articles, editorials, health stories, short phrases, etc., which are published by them without charge.

We are doing our best to obtain the benefits of movies in health education. We have recently made attempts to produce 35 mm. films. The first was documentary, covering the production of smallpox vaccine and the immunization against this disease; another covered the subject of First Aid, and the

subject of the third was on the subject of milk as a food and the way in which the Ministry of Public Health and Welfare is preparing and providing ten thousand bottles of milk daily to the Child Health Centers and Child Keeperships for the indigent children of Mexico City. We have also made some 35 mm. "trailers" for the newsreels.

In the City of Mexico we have two corps of health educators and twenty-five in the rest of the country, who spread health education by several means, chiefly by showing of educational films. In these programs we use 16 mm. films and before each educational picture, we give a short talk related to the specific subject.

In September, 1946, with financial assistance from the Institute of Inter-American Affairs, we began to print some leaflets in offset, with colored figures reproduced from the educational films of Walt Disney, having in the reverse side the most important principles of health education and prophylactic measures recommended in the film. Therefore we are using in a single session and anent a single subject matter, three of the best methods of health education: the spoken word, motion picture, and attractive, pertinent printed materials.

The Institute of Inter-American Affairs has loaned 20 projectors to us and has supplied various films and 5 projectors for the States.

On June 15, 1944, the Children's Health Theater was inaugurated. We called it "children's" not only because of its adaptation to the mind of children, but also because it is performed by boys and girls of primary schools. Many a time we have realized the effectiveness of the dramatization as a way of giving health instruction, not only to the little players, but also to their school fellows, to their families, and even to the public in general.

In October, 1945, puppets began to

be utilized in health education, and it is our plan to use them largely in the forthcoming year, by means of the ambulant theater set up on a truck.

The Section of Health Education Guidance, plays a very important part in our program. It draws up the plans and subjects of health education to be executed by the local health services in the whole country. First of all, every local health service undertakes a preliminary survey to investigate the most important and urgent health education problems in the zone under its care. The results of the survey are reported to the Division of Health Education together with the information about procedures available in the locality, such as newspapers, radio, and motion pictures, the Parent-Teacher Association, health clubs or committees, etc. The Division of Health Education, with due regard to the data of the survey in every zone, develops the appropriate health education program and sends this to every health office.

It is a great misfortune that school hygiene in Mexico is not under the control of Ministry of Public Health. It is under the care of the Ministry of Public Education and only the public schools of the City of Mexico enjoy the benefits of the School Health Service. Consequently, we public health workers have been deprived of the possibility of contributing to health education in the schools. In response to our urgent pleas in 1944, the Division of Health Education arranged a meeting attended by many delegates both from the Ministry of Public Education and the Ministry of Public Health. In this meeting the foundation was laid for the collaboration of public health workers with teachers of primary and high schools under the control of Ministry of Public Education in the whole country, mainly in the rural areas.

Since then, the participation of public health workers in health activities

of the schools has constantly grown, both in extent and significance. Doctors and nurses of the health services in the whole country are visiting schools, giving health talks to pupils, teachers, and parents, creating or reorganizing parent-teacher associations, scholastic health committees, anti-alcoholic units, athletic clubs, etc. Except in Mexico City, doctors of public health services make the school medical examinations both for the pupils and the teachers, and in the most important towns dental clinics have been established in which school boys and girls receive special attention and care.

The Division of Health Education is paying great attention to health education for workers in factories and industries. In Mexico City there are two corps who visit the factories to give health talks to the workers, to convince and induce the employers to coöperate in the eradication of unhealthy conditions in the workshops, etc.

Another task of the Section of Health Education Guidance is to consult with doctors, nurses, or teachers about health education and to answer questions coming from lay people about preventive medicine or hygiene.

We have written and edited the first and second editions of a booklet about the communicable diseases in the rural areas specifically for teachers, to the end that they might learn the principal symptoms of the most frequent communicable diseases among the school children, and the prophylactic measures to be taken in order to prevent the spreading of disease. Formerly we printed and distributed an elementary manual of hygiene, compiled for rural teachers exclusively, to help their task in health instruction given to their pupils.

Finally, the Section of Health Education Guidance controls, advertisements in bearing upon fraudulent and quack

practices. In Mexico there are very few doctors who use professional advertisement and these are not accepted by the honest practitioners. According to law, professional advertisements concerning medical activities must be approved and registered in the Ministry of Public Health, and cannot be published without registration.

The Section of Health Exhibits includes, in the first place, the National Health Museum centrally located in Mexico City, with two store windows in which exhibits are changed at frequent intervals. The Health Museum, inaugurated with some exhibits acquired from the Cleveland Museum in 1942, is constantly increasing its stock by the manufacture of various exhibits, dioramas, wax models, maps, posters, transparencies, etc., on such subjects as tuberculosis, venereal diseases, intestinal parasitosis, nutrition, maternal and child health, industrial hygiene, etc. It receives about one thousand visitors daily, including groups from schools and colleges. In the assembly room of the Museum, a health talk is given and educational films are exhibited twice a day. At all times, one doctor and three social workers are in attendance. A nurse is employed in the immunization against smallpox or diphtheria at request. Fourteen years ago the Public Health Department began to give mail courses on hygiene to rural teachers. Since 1944, the Division of Health Education is giving correspondence courses for visiting nurses in rural areas, and during the present year we began to give mail courses for rural midwives. We are now preparing courses for sanitary inspectors to whom we shall give instruction by mail, next year.

Concisely described, these are the health education activities of each one of the sections of the Division of Health Education in the Department of Public Health and Welfare in Mexico.

# An Evaluation of the Effectiveness of the Astoria Plan for Medical Service in Two New York City Elementary Schools\*

ALFRED YANKAUER, JR., M.D.

*Department of Public Health and Preventive Medicine, Cornell University  
Medical College, and the Bureau of Child Hygiene, New York City  
Department of Health, New York, N. Y.*

SELECTIVE Service rejection and "defect" statistics in the two World Wars have caused expressions of opinion to the effect that "the health level of the American people has not improved to the same degree as mortality in recent years."<sup>1</sup> It has also been stated that these findings reveal "many neglected physical and mental inadequacies which could and should have been prevented and corrected in childhood."<sup>2</sup> Such statements reflect upon the educational and medical supervision which the child receives in school, and raise the question as to how these services could be improved.

In New York City the elementary school health services operate on the basis of recommendations made by the Astoria Demonstration Study.<sup>3</sup> These recommendations, known as the Astoria plan, were adopted in the fall of 1940. They center around continuity of record keeping and a yearly conference of teacher and nurse in which the health status of each pupil is reviewed. Children with questionable health problems or problems which cannot be handled directly by the teacher or nurse are referred to the school physician for examination. Routine health examinations by the school physician are performed only on children entering

elementary school who have not been examined by an outside agency. Throughout the remainder of elementary school the child is examined by the school physician only if "selected" at a teacher-nurse conference.

Certain questions have arisen with respect to the operation of the Astoria plan in the light of Selective Service findings. Are there sick or handicapped children attending regular classes who have not received medical care or proper school placement simply because routine examinations have not been performed, and teacher or nurse is not sufficiently aware of disease symptoms or signs? If a careful initial examination is performed, can the system of teacher observation be trusted to bring to light children in need of care? What would be the value of additional routine examination by grade, with and without the presence of the parent at the examination?

Since the Astoria plan has operated for a period of six years, the health of children now in the sixth grade of New York schools should be some indication of the plan's effectiveness, provided a sufficiently large and representative sample were examined. Such an examination should also disclose snags in the operation of the plan itself and

point the way toward an answer to some of the questions raised in the preceding paragraphs.

#### MATERIAL

Two elementary schools in the Kips Bay-Yorkville health district were selected for study. The 100 acre area from which these schools draw their pupils presents some significant features. On the one hand, the physical environment and conditions of life are poor, and the economic status of the population is approximately 25 per cent below that of the city-wide average.<sup>4</sup> On the other hand, a medical center, a health center, a settlement house, and a large dental clinic are located within the area, and two other large medical establishments are within short walking distance. Thus adequate free or low-cost health, medical, and dental services are easily accessible outside of the school. In addition, considerable mass health education has been carried on in this district, and it has served as a city-wide training center for school physicians.

There were 149 pupils in the sixth grade classes of these two schools, of whom 114 (58 boys and 56 girls) constitute the subjects of this study. All children were white, and the majority were of Czechoslovakian, German, or Italian ethnic background. Ages ranged from 11 to 13, the majority falling 6 months on either side of the 12th birthday. In 108 cases the mother was present at the interview, and in the remainder a responsible adult member of the family was present. Seventy-seven (68 per cent) of these children had been examined by the school physician on entry to elementary school. The remainder had been examined at that time by private physicians or hospital clinics, and the results incorporated into the school medical records.

Thirty-five of the 149 children in the two schools are not included in this survey. Of these, 23 were not

given appointments because they had entered the school system after 1941, or because of parental inability or unwillingness to attend the examination, and 12 were given appointments which were broken. The school medical records and teacher judgments of these 35 children did not differ from those of the rest of the group, and it is not felt that their exclusion is of significance.

In New York City schools special classes exist for children with pronounced defective vision and with orthopedic handicaps or cardiac disabilities which prevent their attending regular classes. In addition, Health Improvement Classes are maintained for children to whom the unmodified school regime might be detrimental for a variety of medical reasons. Since the children examined were all attending regular classes, it is obvious that the group is a selected one, and it can be assumed that major physical disabilities have been eliminated from it.

#### METHOD

The parent was interviewed in the presence of the child, every effort being made to elicit a spontaneous anamnesis. Health problems and attitudes, the effects of previous medical contacts, the nature of family life in the home, and of parent-child relationships during the interview were particularly sought. Material contained in the school medical records was utilized for questioning. Elements of a routine pediatric history which remained uncovered after all leads had been followed were then reviewed directly. The interview was followed by a complete physical examination of the child, which included the eye grounds. Approximately 40 minutes were devoted to the combined interview and examination.

Weights and heights, Snellen chart tests of visual acuity, and group 4-A audiometer tests for hearing loss were taken from teacher recordings on the

school medical records. Sahli hemoglobin determinations were performed on each child, and urines were tested for abnormalities of the sediment and the presence of sugar and albumin.

Positive findings reflecting the physical and mental health of the child were recorded. In cases of suspected physical disease, referrals were made for further diagnostic assistance. Direct review of clinic records, interview with attending physician, or written reports from outside sources were utilized in arriving at diagnostic decisions. An estimate of whether a "defect" could have been noted prior to the current examination was made on the basis of existing records and direct questioning of the parent.

When an entire class had been

examined, the teacher was consulted and asked to select children who seemed disturbed in personal and group relationships, and this information was incorporated into the findings.

It should be emphasized that the method used in obtaining data is considerably more exhaustive than the usual school health examination.

## RESULTS

### 1. *Physical Health*

Results of medical appraisal expressed in terms of physical defects are tabulated in Table 1. It will be noted that the majority are minor in nature or receiving adequate medical care. Defective teeth and nutritional deficiencies were not individually evaluated because it was felt that they require methods

TABLE 1

*Distribution of Physical Defects in 114 Sixth Grade School Children*

<i>Physical Defect</i>	<i>Known to School</i>		<i>Unknown to School</i>	
	<i>Under Care</i>	<i>Not Under Care</i>	<i>Under Care</i>	<i>Not Under Care</i>
Visual: 44 (57%)				
Refractory error	34	5	..	..
Traumatic cataract	1	..	..	..
Heterophoria ( $\pm$ 20/30 vision)	2	..	..	2
Surgical: 9 (12%)				
Phimosis	..	..	..	4
Lipoma (8 cm. in diameter)	..	..	..	1
Epigastric hernia (symptomatic)	..	..	..	1
Paraumbilical hernia (symptomatic)	..	1	..	..
Inguinal hernia	..	..	..	1
Anomaly of scrotum (fusion to thigh)	..	..	1	..
Cardiac: 8 (10%)				
Congenital acyanotic H D	1	..	..	..
Possible H D	2	..	..	2
Potential H D	1	..	1	1
Orthopedic: 6 (8%)				
Pronated feet (asymptomatic)	..	..	2	3
Forearm contracture (post-trauma)	1	..	..	..
Allergic: 4 (5%)				
Asthma (mild)	2	..	..	..
Rhinitis (mild)	1	..	..	1
Miscellaneous: 6 (8%)				
Hearing loss (less than 20 db)	..	..	1	..
Pituitary dwarfism (?)	1	..	..	..
Petit mal (?)	1	..	..	..
Albuminuria (cause undetermined)	..	..	..	1
Anemia (Probably nutritional)	..	..	..	2
Totals: 77	47	6	5	19
Percentage totals: 100%	61%	8%	6%	25%



more accurate than those employed in this survey. However, all children examined had received some form of dental care; no gross dental neglect was evident; unqualified signs of nutritional deficiency or undernutrition were not observed. Body posture was not evaluated because of its non-specificity. However, no organic postural defects were observed, and symptoms ascribable to "poor posture" were not manifest. Minor skin diseases (pediculosis, epidermophytosis, acne, etc.) are not included in the tabulation.

It is estimated that 18 (75 per cent) of the 24 defects unknown to the school could have been brought to school or parental attention prior to the current examination if elements of the Astoria plan had functioned as intended: 13 at the time of initial examination and 5 at the time of teacher-nurse conference.

Parental resistance accounted for 2 of the 6 defects known to the school but not under care, and the remaining 4 were overlooked at the teacher-nurse conference.

Of the 19 defects unknown to the school and not under care, 15 (79 per cent) could have been discovered at the present time by physical examination alone. Parental presence was necessary for the detection of 1, and laboratory procedures for the detection of 3.

*Vision*—No child with corrected vision of 20/50 or worse in the better eye was observed in this group. Thirty-nine children (20 boys and 19 girls), an incidence of 34 per cent of the total group examined, had uncorrected vision of 20/40 or worse in one or both eyes. They were all fitted with glasses and (with the 5 exceptions noted in Table 1) had had their glasses checked within the past twelve months. There were 6 children with heterophoria and a vision of 20/30 or better in both eyes. Two of them were known to the school and under care. The remaining 4 were unknown and not under care; 2 of these 4

were thought to need care after an ophthalmologic work-up and are listed in the table.

*Tonsils and Adenoids*—No children were observed in whom tonsillectomy or adenoidectomy seemed to be indicated on the basis of frequent sore throats, otitis media, cervical adenitis, hearing impairment, or nasal obstruction. Tonsillectomy and adenoidectomy had been advised in 26 children (31 per cent of the group) on examination in the first grade 6 years previously. Only 14 of the 26 had been operated upon. No significant differences in general health and frequency of respiratory infections could be observed between the tonsillectomized and the non-tonsillectomized groups.

*Heart*—Only one case of definite organic heart disease was present in this group. This was a congenital acyanotic cardiac, Class 1-B,<sup>5</sup> known to the school and under care. It is considered that this case would have been overlooked on routine physical examination since it presented no unusual signs. There was no child with a definite history of a rheumatic episode or signs of clear-cut heart disease. There were 16 children in whom the possibility of heart disease arose but in whom a diagnosis of organic disease could not be made. In 6 cases there was a history of rheumatic fever in parent or sibling but no evidence of disease in the subject. In 3 cases an apical or left sternal systolic murmur heard on examination was considered of no significance after a cardiologic work-up. The remaining 7 cases were classified as "possible" or "potential" heart disease, using criteria of the New York Heart Association,<sup>5</sup> after cardiologic work-up, including fluoroscopy, had been performed.

*Hemoglobin*—The mean Sahli hemoglobin of the group was 13.3 gm., with a standard deviation from the mean of 0.3 gm. There were 8 children with

values of 12.0 gm. and 2 children with values of 11.0 gm. These 2 children had no symptoms or signs of anemia and appeared to be in good health. They were not of Mediterranean origin, and it is considered that their anemias were of nutritional origin.

*Urinalysis* — Only one significant urinary abnormality was found. This was a non-orthostatic albuminuria with a negative sediment. In spite of further work-up its etiology is still undetermined at the present time. There were 10 cases of orthostatic or benign albuminuria (an incidence of 9 per cent). Repeated clean-voided specimens were negative in the case of 4 girls who had shown 6 or more wbc/hpf. There were 2 children who had past histories of acute glomerular nephritis but showed no evidence of disease at the time of examination.

## 2. Mental Health

An impression of disturbing factors in the child's home environment and emotional life was sensed in 44 children (26 boys and 18 girls). This comprises 38 per cent of the total group. Thirty-three of these children showed some evidence of disturbance in their classroom work and associations as observed by the teacher. Of this group, 10 were considered so disturbed that formation of mature patterns of thought and a constructive approach to adult reality situations were seriously interfered with, and the probability of future psychosomatic problems correspondingly enhanced.

All of these 10 children were known to the school in the sense that their present and past teachers were aware of and had recorded their deviant behavior. However, its significance was not always appreciated by them. Five of the 10 children had been selected for examination by the school physician. Five had been taken frequently to purely medical agencies because of

somatic complaints, and one child had received intermittent psychiatric help through a social agency.

Brief protocols of 3 typical cases are presented to show how these impressions were gained.

*Charles H.*, age 11½, is a moderately obese, quiet child whose father believes that he must stay out of fights and roughneck associations and "go his own way without making and trouble." Therefore he goes to the park with his mother after school hours and plays by himself. He has never been away from home nor will his mother consider sending him. She is certain that she will only have to take him home again as she did with his thin (enuretic until the age of 15) older brother who has recently been rejected by the Army because of "high blood pressure." During the examination the boy is abused by his mother because of an undershirt which is not spotless (yet by no means unclean), and he is praised for being such a neat, clean child who is always careful of his appearance. His obesity is easily accounted for by the quantity and quality of what he is reported to eat. Almost in the same breath he is derided for not adhering to a low-carbohydrate regime prescribed by a physician, yet reminded with pride how eager his mother is to fulfil his expressed food desires. He is practically badgered into saying that he has everything he wants. It is difficult to get him to talk in his mother's presence, but he expresses no overt desire to change his way of life. Yet he frowns and appears upset when his mother is talking, seeming particularly disturbed when she discusses his brother's camp experience. His teacher states that he is silent, shy, and studious in class, and always holds himself apart from the group. His mother accompanies him to and from school every day and he is regarded as something of a curious phenomenon by his classmates.

*Eileen S.*, age 11 3/12, is a thin, hirsute, overactive child who has been taken to many clinics and private physicians by her stout, anxious mother because of her "poor appetite," "nervousness," vomiting, headaches, and a variety of other complaints. She has been studied thoroughly and hospitalized on two occasions. No appreciable benefit has resulted. Her mother states spontaneously that she has spoiled her child and probably that is the whole trouble, but this thought is something she tends to dismiss with a smile as unimportant. Eileen prefers to spend her spare time reading or helping around the house.

The reason she gives for not participating in extracurricular group activities is that she is "afraid of getting nits." Her teacher has observed that she finds it difficult to remain on friendly terms with other children in the class and frequently quarrels with them. She is a very conscientious, aggressive, and competitive scholar. She worries a great deal about the caliber and quality of her school work which is, in fact, quite superior.

*Walter P., age 12 3/12, a thin, drooping child of a widowed mother, sucks his thumb and occasionally wets his bed. He has little contact with children his own age except in the classroom and seems to prefer the society of adults. His mother feels that he would only get beaten up by bigger and rougher boys and that this is a commendable preference anyway. He spends a great deal of time with paternal relatives where, as the only child, he is deluged with presents, compliments, and attention. On examination he is extremely tense and cannot be drawn to talk at all. He is quite embarrassed at having to disrobe. His teacher has noted that he is very unpopular with his classmates. He annoys and teases them but runs away in fright when he is attacked, frequently coming to her whining and crying over a quarrel he himself has instigated.*

#### COMMENT

Remarkably little evidence of physical ill health was observed in the group of children examined. The majority of physical defects or adverse conditions found were known to the school and under care. Most of those not falling into this category could have been brought to parental attention earlier if a more complete initial school examination had been performed. The Astoria plan functioned satisfactorily in these two schools.

However, these observations are necessarily limited to the district in which the survey was made. Its characteristics have already been pointed out, and it is entirely possible that, in an area where medical facilities are less easily accessible, different conditions prevail among the school children. For this reason a similar study is contemplated in schools located in a dis-

trict whose socio-economic level is on a par with that of Kips Bay-Yorkville, but in which medical and health facilities outside of the school are not as adequate.

If viewed solely as a screening mechanism for the detection of physical defects, the presence of the parent at the current examination was unnecessary. However, such a conclusion is overbalanced by the demonstrated value of the parent's presence in obtaining further study and care for defects<sup>3,9</sup> as well as by other factors which will be discussed.

Recent trends of thought in the field of school health<sup>7,10</sup> have emphasized the fallibility of shaping school medical services solely to prevent and correct physical defects. The importance of educating parent and child to seek early medical assistance, of promoting a positive attitude toward the maintenance of health, and of dispelling inherent fears of doctors and disease by making the examination a desirable educational experience, has been stressed. The presence of the parent and the provision of adequate physician time are essential if this is to be accomplished in the elementary school.

Judging from the findings detailed in the section on mental health, the more time and care that is taken in the interview, the more psychic and behavior problems will be unearthed. Limitations of time and technic precluded a more accurate evaluation of the degree and significance of psychic disturbance in the individual child. Yet these findings as a whole are significant. They emphasize that this is a major field for study and direction in school health work. This is particularly true if psychic disturbances in childhood are viewed broadly as the generating forces in adult personality types and many forms of psychosomatic disorders, as well as of "mental disease" in a narrower sense.

In New York City the Bureau of Child Guidance of the Department of Education is set up to care for emotionally disturbed children and to work with teachers, and there are a number of hospital clinics and social agencies to which these children can be referred. Yet all these facilities are overburdened with work and able to reach only a small fraction of those needing their care. The necessity for expanding these facilities and for pediatricians and general practitioners to absorb some of their load is obvious.

For many years mental hygienists and some educators have felt that the adult and group contacts of the child in the classroom could be utilized to prevent a further ingraining of neurotic patterns of thought and perhaps to correct these patterns.<sup>6</sup> Yet before such an approach can be realized, major changes in the school curriculum and administration, in the size of classes, and in the qualifications of teachers are called for.<sup>6</sup> Public action effecting such changes should be vigorously supported by the medical and public health professions. They are part of a constructive answer to the challenge which the draft statistics presented, that of "seeking and correcting in childhood the roots of many adult diseases."<sup>8</sup>

#### SUMMARY

1. A health interview and examination of 114 sixth grade children is reported. The children attended two New York City elementary schools which have operated for 6 years under

the Astoria plan of school medical service.

2. Only minor uncared for physical defects were observed, but there were a significant number of children in whom the seeds of future mental disturbance were sensed.

3. Most of the uncared for physical defects could have been picked up if a more complete examination had been performed on entry to elementary school.

4. The Astoria plan of school health service functioned satisfactorily in the schools surveyed.

5. The need for further study and care of emotional disturbances among school children and some of the implications of this need have been discussed.

#### REFERENCES

1. St. J. Perrott, G. Selected Service Rejection Statistics and Some of Their Implications. *A.J.P.H.*, 36:336-342 (Apr.), 1946.
2. Health Needs of School-age Children and Recommendations for Implementation. *School Life*, 28:7-14 (Nov.), 1945.
3. Nyswander, D. N. *Solving School Health Problems*. New York: The Commonwealth Fund, 1942.
4. *Health Center Districts, New York City, Statistical Handbook*. New York: Neighborhood Health Development, Inc., 4th ed., 1944.
5. New York Heart Association. *Nomenclature and Criteria for Diagnosis of Diseases of the Heart*, 4th ed., 1945.
6. Ryan, W. C. *Mental Health Through Education*. New York: The Commonwealth Fund, 1938.
7. Baumgartner, L. Some Phases of School-health Services. *A.J.P.H.*, 36:629-635 (June), 1946.
8. Ciocco, A. Physical Growth in Childhood and Military Fitness. *A.J.P.H.*, 35:927-933 (Sept.), 1945.
9. Walker, W. F., and Randolph, C. R. *School Health Services*. New York: The Commonwealth Fund, 1941.
10. *Suggested School Health Policies*. Report of the National Committee on School Health Policies. New York: Health Education Council, 1946.

# Rickettsialpox—A Newly Recognized Rickettsial Disease\*

## III. Epidemiology

MORRIS GREENBERG, M.D., OTTAVIO J. PELLITTERI, M.D.,  
AND WILLIAM L. JELLISON

*Acting Director, Bureau of Preventable Diseases, and Epidemiologist, New York City Department of Health; and Parasitologist, U. S. Public Health Service, Hamilton, Mont.*

DURING the summer of 1946, an outbreak of an unclassified disease occurred in a housing development in one of the boroughs of New York City. A clinical, epidemiological, and laboratory study was undertaken by the New York City Department of Health in coöperation with the U. S. Public Health Service in July and was completed in October. This report will deal with the epidemiological features of the epidemic.

### LOCATION OF OUTBREAK

The outbreak was localized to a development consisting of a group of 69 houses in the Borough of Queens in New York City, about 15 miles from the center of the city. The houses occupy three oblong blocks, each block consisting of 23 connected houses arranged so that some face wide courts and others face the street. They are three stories in height, two or three families living on each story, and each family occupying three or four rooms. The general arrangement of the houses is the same in each of the blocks. There are small houses in the immediate

vicinity, but no cases of the disease were reported in residents of these. The neighborhood is suburban in type with wide streets, many trees and bushes, well kept lawns, but surrounded at a distance by large lots of unkept grass, weeds, and scrub forest. Close to the development are several highways on which considerable traffic passes between New York and Long Island. A total of 483 families occupied the apartments in the development at the time of investigation. The total number of residents was about 2,000, of whom 600 were children under age 15.

Cases were first seen by physicians in the neighborhood at the beginning of the year 1946.† Some of the physicians thought they were dealing with atypical chickenpox; others were unable to make a diagnosis. By early summer it became evident that the disease was occurring in a sharply localized epidemic. Intensive investigation was started in July. Doctors practising in the vicinity were canvassed and histories were obtained of earlier cases. All newly reported cases were visited by one of us. Patients and other residents were

\* From the Bureau of Preventable Diseases, New York City Department of Health and the Rocky Mountain Laboratory of the Division of Infectious Diseases, National Institute of Health, Hamilton, Montana.

† Dr. Leon N. Sussman of Manhattan, Drs. Benjamin Shankman, Harry N. Zeller, and Joan Daly of Queens. We are indebted to these physicians for their coöperation. Dr. Sussman and Dr. Shankman have published reports of their cases.<sup>1</sup>

questioned about the occurrence of similar cases in other residents and

TABLE 1  
*Rickettsialpox Distribution of Cases by Age*

Age	Number of Cases	Population	Incidence per Hundred
0-1	2		
1-4	16		
5-9	11		
10-14	3		
0-14	32	600	5.3
15-19	..		
20-24	3		
25-29	9		
30-39	42		
40-49	23		
50 and over	15		
15 and over	92	1,400	6.5
Total	124	2,000	6.2

friends. A canvass was made of about half of the 69 buildings in the three block area and a systematic visit was made to each resident in these buildings.

Records of 124 cases who had become ill between January and October were obtained. These are arranged in Figure 1 according to week of onset. The sex distribution was approximately

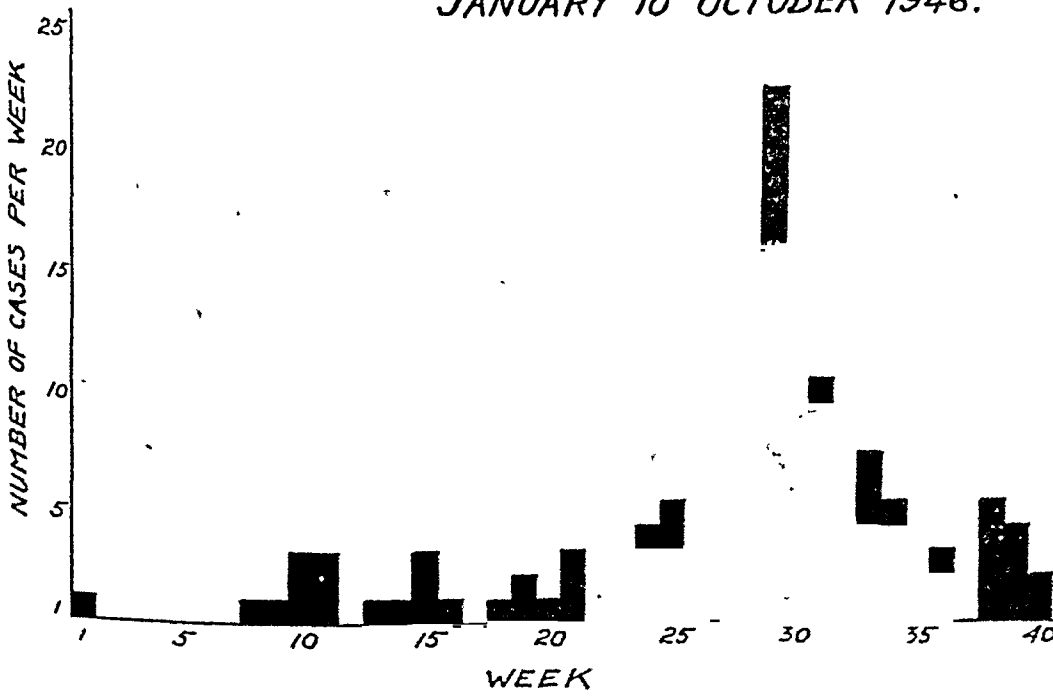
equal: 63 males and 61 females were affected. Table 1 shows the distribution of cases by age. Cases occurred among all age groups, the youngest was an infant of 3 months, the oldest a woman of 71. The incidence in children under 15 was 5.3 per cent, in adults, 6.5 per cent. In the entire group it was 6.2 per cent. All residents of the buildings and most of the employees were white. There were, however, some Negro porters. No cases were seen among the Negroes.

CLINICAL FEATURES

The clinical features have already been described elsewhere.<sup>2</sup> In brief, there occurred an initial lesion at the presumed site of bite by a mite, a papule, which when fully developed measured 1/2 to 1 1/2 cm. in diameter. The papule became vesicular in the center and dried, leaving a black eschar. This eschar ultimately sloughed leaving a small scar. The regional lymph glands usually became enlarged. About

FIGURE 1

*RICKETTSIALPOX - ONSET OF CASES BY WEEK - JANUARY TO OCTOBER 1946.*



a week after the occurrence of the initial lesion, there was an acute onset of illness with fever, chills, sweats, backache, and headache, followed in from 2 to 4 days by a maculopapular and papulovesicular rash. The duration of illness from initial lesion to complete recovery was about 3 weeks; the duration of the acute symptoms and of the rash was about 1 week to 10 days. There were no complications and no deaths. Laboratory findings were generally negative except for leucopenia. The usual bacterial agglutination tests were uniformly negative in the convalescent as well as the acute stage of the disease.

#### EPIDEMIOLOGICAL FEATURES

There appeared to be no relationship between disease incidence and occupation. Many of the adult female cases were housewives. Cases also occurred among both men and women who worked in various occupations in different parts of the city. There were among them salesmen, manufacturers, office workers, teachers, foremen, etc. No one occupation predominated. The children of primary school age attended public schools in the vicinity; those of high school age travelled to one of several schools in the city.

The possibility that the disease was imported was investigated. Of the total number of 124 cases, 112 were born in this country. The remainder had been born in European countries but had lived in the United States for a number of years. The median length of residence in the same apartment was between 3 and 4 years. Only 3 patients had lived there less than 1 month. Except for a few whose cases will be discussed later, none had been out of the city in the month preceding the onset of illness. None of the cases occurred in returned veterans.

Although few of the patients manifested even mild gastrointestinal sym-

toms, the possibility of a source of infection through a common food article was investigated. Morning and evening meals were almost always eaten at home. Lunch was eaten at home by the housewives and the small children. The older children ate at the schools they attended and the employed adults ate in various restaurants near their places of employment. Provisions, including meats, groceries, and cakes, were purchased from one of several markets in the immediate vicinity. The same markets supplied families where cases occurred and those where no cases occurred. Furthermore, residents in the surrounding areas purchased their supplies from the same markets that were patronized by the residents of the development.

Milk was also obtained at the provision markets. It came in sealed glass or cardboard containers, pasteurized, and approved by the Department of Health. The milk was supplied to the markets by ten different wholesale distributors. The same brands of milk in similar containers were sold to other residents of the Borough.

Water was supplied to the development from the regular New York City system through six 3 inch brass service lines. All the piping was brass. Flush tubes of water closets were provided with vacuum breakers. All wash stands, bath tubs, and kitchen sinks were provided with over-rim water supply fixtures. Water pressure was adequate. No breakdowns, defects, or other emergencies had occurred for many months. Samples of water were taken at two different units; analysis indicated water of good, potable quality.

Sanitary inspections of the immediate neighborhood yielded negative results. Two vacant lots adjacent to the development were inspected. They were covered by vegetation. There had been heavy precipitation in the days prior to the inspection, but only one mosquito

breeding impoundment was found. This was in the basement of an unfinished building about 200 yards from the apartment houses. Mosquito larvae were abundant in this water, and numerous adults collected from the ceiling of the basement were identified as *Culex pipiens* L. by Dr. Alan Stone of the U. S. National Museum. Adults of this same species were found to be fairly abundant in dark basement corners in the affected apartment houses. Specimens collected in the apartment basements were tested for infection, with negative results. The shrubbery was carefully searched but no ticks were found. The lots were sanitary, and although dog droppings were seen and field mice were in evidence, no garbage or bulk of other offensive material was found. The seeded area and the shrubbery along the highways near the development were also inspected. Here, too, no insanitary conditions were found, nor were ticks observed in the shrubbery. The seeded areas in the immediate vicinity of the apartments were mowed regularly.

There were two dogs kennels near the development and these were inspected and their owners interviewed. The dogs were clean and free of fleas and ticks. The shrubbery at the kennels was likewise free of ticks. Two nearby riding stables, occasionally patronized by residents of the development, were also inspected. No mosquitoes were seen on the walls and ceilings and no ticks were found on the horses.

Although the management of the development did not permit animals in the apartments, some of the tenants did keep dogs. A number of these tenants were interviewed. None had noted ticks on the dogs. Examination of dogs seen near the houses did not reveal ticks or insects on any of them. In almost all instances the animals were quite clean.

The buildings were new and modern

in design. The apartments were generally found to be clean and spacious in relation to the size of the families concerned, and the standard of living was high. Most of the windows were screened. The tenants were specifically asked about the presence of insects. They rarely saw mosquitoes; flies were not bothersome; and ticks were never seen. All the tenants interviewed were certain, however, that rodents were abundant. These were house or field mice and were seen in the basements of the buildings, in the courtyards, and in some of the apartments. Mice were particularly in evidence in the basements, which were used as storage places, and which also housed the incinerators of the buildings. Living and dead mice were seen in the basements, in the incinerators, and in the courtyards, and mouse droppings were also in evidence.

The possibility that the rodents played a part in the transmission of the disease was considered and a temporary laboratory was established in one of the buildings in order to trap numbers of them for study, and also to examine them for ectoparasites. A clue to the possible vector was furnished late in July, 1946, by Charles Pomerantz, who discovered small mites on the basement walls. These were identified as *Allodermanyssus sanguineus* (Hirst).\*

At this stage of our investigation a strain of rickettsia had been isolated from the blood of a patient.<sup>3</sup> Antigens prepared from it (M K strain) gave positive complement-fixation reactions when tested with sera of recovered cases, but gave negative reactions when tested with the serum of normal human beings and of recovered cases of syphilis, endemic typhus, tsutsugamushi fever, and Q fever. There was some serologic relationship to Rocky Moun-

---

\* Identification of original specimens was made by E. W. Baker, of the Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture.



tain spotted fever; about 80 per cent of the sera from recovered cases also gave a positive reaction with the antigen of Rocky Mountain spotted fever, but in lower dilutions than with the M K antigen. The name rickettsialpox was proposed for the disease. Later, an identical strain of rickettsia was isolated from the blood of another patient.

Systematic trapping of rodents and collection of mites from walls and mouse nests in the different buildings of the development were carried out. Several types of suction apparatus were used for drawing the mites into vials. While some of the mites were found on freshly trapped house mice (*Mus musculus*), most of them were recovered from the external walls of the incinerators in the basement. Some were flat and colorless and had apparently not recently fed, while others were engorged and bright red in color. Smears made from the latter showed typical mammalian erythrocytes. The numbers found varied in the different buildings. On the incinerator walls of some of the buildings no mites were found, on the walls of others they were found in small numbers, and on the walls of still other houses they were found in abundance, as many as 100 being collected from the walls of a single incinerator. It must be pointed out that differences in the temperature of the walls and other factors may have influenced the number of mites found at one time. No other rodents and no other rodent parasites were found in the development during our investigation. Rickettsial strains were isolated from each of two lots of mites. The isolation of these strains and the establishment of their identity with the M K strain isolated from a rickettsialpox patient were discussed in an earlier paper<sup>4</sup> of this series and the name *Rickettsia akari* was proposed for the organism.

There was an incinerator in each building serving the needs of the six to

nine families living in the building—a total of 69 incinerators. Openings to a chute leading down to each incinerator were provided on the respective floors of each building; the openings were closed by a hinged, metal door when not in use. Each incinerator was located in the basement and was composed of two brick-lined compartments, the openings of which were protected by hinged iron doors. The upper and lower compartments were separated from each other by an iron grate. Both compartments were part of and continuous with the chute leading to the upper floors. Garbage, paper, and refuse thrown down the chute by the tenants landed on the fire grate of the incinerator in the basement. Once or twice daily an attendant was supposed to set fire to the material. As it burnt itself out, the ashes and small debris would fall through the grate into the lower compartment, whence it could be removed into large cans for disposal by the Department of Sanitation. All objects not reduced by fire were picked out of the upper compartment by the attendant. Even the debris falling through the coarse fire grate contained much food for mice.

This method of garbage and waste disposal might have worked out well under normal conditions. During the four or five years preceding the outbreak however, the services of laborers had been at a premium. In this group of houses, as elsewhere, the necessary complement of handymen was lacking; as a result the buildings were not cleaned as well as formerly; basements were dirty and cluttered up, and the incinerators were not regularly fired. Combustible material was not sufficient to complete incineration of the garbage. The accumulation of garbage in the upper compartments of the incinerators and even the debris in the lower compartment furnished an excellent food supply for mice. Both living and dead

mice were found by us on our inspections. When disturbed by the opening of the door to the compartment, the mice would scamper about and disappear in the crevices between the bricks.

Many of the tenants interviewed complained of the presence of mice. Some had seen them only in the basement, others complained in addition of hearing them at night in the walls. Some found mice in their apartments. In two instances, mice were actually found by the tenants in the beds used by patients. In one apartment, mouse droppings were observed in a patient's bed between the sheet and mattress, and mice were caught in traps laid in this apartment. Not all houses were equally afflicted nor were the three blocks of houses equally infested. Block I was apparently the greatest sufferer. Whether this was due to less adequate and conscientious janitorial service in this block compared to the others, we are not prepared to state. It should be mentioned that there was no regular exterminating service in the houses at the time of our investigation.

Complement-fixing antibodies of rickettsialpox were demonstrated in sera from trapped mice. Such antibodies could not be demonstrated in laboratory mice nor in mice trapped in the Washington area. An organism identical with the M K strain of rickettsialpox was recovered from one of the mice trapped in the infested apartments.<sup>5</sup>

A routine search for mites was made in the houses of the development, par-

ticular attention being paid to the basements and especially the incinerator walls. Some of the houses were visited more than once, but repeated visits were not made to all the houses. In 9 of the 69 houses no search was made because the basements were locked and the attendants could not be located at the time of visit. In Table 2, the total number of reported cases is arranged according to the block of residence and the presence of mites in the building. It will be noted that 67 cases were reported from 19 houses in which mites were found, an incidence of 3.5 cases per house, as compared with 42 cases observed in 41 houses where no mites were found, an incidence of one case per house. Stated differently, mites were found in 19 or approximately one-fourth of the houses; from these houses came 67, or more than half of the known cases. It is also interesting to observe that in each of two buildings in which mites were found in great abundance, one in Block I and the other in Block III, 8 cases were found as compared with an average of 3.5 cases per building in which mites were found, but not in abundance.

Another point of interest was the occurrence of multiple cases in families. The 124 cases investigated were reported from 78 families. Single cases were reported from 47 families, 2 cases each from 20, 3 cases each from 7, and 4 cases each from 4 families.

Although many of the patients referred to the initial lesion as an insect bite, none actually recalled being bitten

TABLE 2

*Rickettsialpox Cases Distributed According to Residence and Presence of Mites in Building*

Building →	Block I		Block II		Block III		Total	
	Number of		Number of		Number of		Number of	
	Buildings	Cases	Buildings	Cases	Buildings	Cases	Buildings	Cases
Mites found	12	47	3	4	4	16	19	67
No mites found	6	13	19	20	16	9	41	42
No search made	5	15	1	0	3	0	9	15
Total	23	75	23	24	23	25	69	124

and none saw a mite or insect at the site of the initial lesion. However, three housewives in whose families cases occurred had noticed tiny blood spots on the bed sheets.

After the investigation at the development was terminated, we examined two patients with rickettsialpox in other parts of the city, both of whom volunteered the information that they had been bitten. One was a boy of 17 who recalled being bitten on his arm while in a stable and scratching the site vigorously. The other was a nurse who said she was bitten on her right hand. Both later developed an initial lesion of rickettsialpox at the site of the bite, one on the same day and the other two days after being bitten. Neither had seen a mite or insect on the skin.

#### OTHER CASES IN NEW YORK CITY

As information about the clinical aspects of the cases began to reach physicians, we were called upon to see suspected cases in various parts of the city. By the time our investigation had ended we had seen 20 additional cases in four of the five city boroughs. Particular interest is attached to a group of cases in an apartment house in the Bronx at some distance from the site of the above outbreak and, as far as we were able to determine, completely unrelated to it. The house is an 11 story brick and stone building and has 102 apartments. There are two self-service elevators, and two incinerators. A physician,\* who has his office in the building, informed us that he had seen many cases in residents of the building in the past few years, which he had diagnosed as atypical chickenpox. He had records of 10 cases. His description of the clinical findings was typical of our cases. Blood counts in all of his cases showed a moderate leucopenia, but other usual laboratory tests were

negative. We were able to interview two of the patients who had recently recovered and to obtain blood specimens from them. The sera gave positive complement-fixation reactions with the M K antigen (strain of rickettsialpox) in high dilutions; they did not agglutinate the antigens of *Proteus* OX 19, OX 2, or OX K.

The tenants and the physician stated that they were not bothered by mosquitoes, ticks, flies, or other insects, but mice had been seen. We visited the basement which is on a lower level than the main entrance. Many of the tenants use the basement entrance when leaving and returning. We inspected the incinerators and found garbage in the upper compartments. On the walls of one of the incinerators were many mites, both flat and engorged, which we collected. These were identified as *Allodermamysus sanguineus*. Three mice were trapped, one in the incinerator and two in the storage room. The serum of one of these gave a positive complement-fixation reaction with the M K antigen of rickettsialpox in a dilution of 1:64.

#### INCUBATION PERIOD

Since the patients had lived continuously in the development and since none recalled being bitten, the incubation period could not be definitely determined in most cases. In one instance, however, it was found to be 10 days. In this case a woman living in Manhattan visited her daughter and son-in-law, both of whom were ill, on one day only. She developed acute symptoms 10 days later; she observed an initial lesion 3 days before onset. In 2 cases outer limits could be determined: one of us (W.L.J.) became acutely ill 23 days after arriving at the development to set up a laboratory; an initial lesion was first noted 8 days before onset of illness. Another patient became ill 24 days after returning to her home from a vacation

\* Dr. Victor Stern

she noted an initial lesion 9 days before onset of symptoms. In the case of two members of a family, the lower limit of incubation was determined. Both became ill out of town, one, 9 days after leaving home, and the other, 11 days; only one of them had observed a primary lesion 5 days before onset of symptoms.

#### CONTROL MEASURES

Methods of control are under study. The elimination of mouse harborages appears to be an important factor in such control. The landlord was ordered to clean up the basements, take adequate measures to kill mice in the buildings, and to see to it that the incinerators were properly fired at least once daily.

#### COMMENT

The results of the investigation of the epidemic in Queens indicated that we were dealing with a hitherto undescribed disease, rickettsialpox, caused by an organism, *R. akari*, which was recovered from the blood of two patients early in the disease. The concomitant finding of bloodsucking mites, *A. sanguineus*, in the group of buildings where the patients lived, and the recovery of *R. akari* from two pools of these mites justified the belief that the mites were the vectors of this disease. The only other parasites or hematophagus insects found in the buildings were adult mosquitoes. Several hundred were collected from dark basement corners. Some were tested for infection, with negative results. Specimens sent to the National Museum were identified as *Culex pipiens* L. by Dr. Alan Stone. The only rodents found in the housing development were house mice, which were present in large numbers. The finding of mites as ectoparasites of mice, the presence of mammalian erythrocytes in smears made from engorged mites, the laboratory determination of the presence of complement-fixing antibodies of rickettsialpox in the blood of trapped

mice, and the isolation of *R. akari* from one of them, indicated that the mice acted as the animal reservoirs. The occurrence of a significantly greater number of cases in buildings where mites were readily found and the finding of multiple cases in families strengthened the hypothesis that the mites were the vectors of the disease.

The initial lesion probably represents a reaction to the bite of an infected mite. That no patient remembered being bitten is not surprising in view of the small size of the mite and the fact that no itching or pain was caused. It is not unusual for persons to be bitten by ticks and to be unaware of the fact until the acarid is discovered adhering to the skin or scalp by another person.

It is interesting to observe that rickettsialpox, as here observed, is a domiciliary disease. In the epidemic described, incinerators played an important role in maintaining the infection. This was not due to anything inherent in incinerators but to the fact that if not fired frequently and regularly they become excellent harborages for mice due to the accumulation of garbage. Also, they are warm and the particular mites identified as vectors of rickettsialpox thrive well in warm places. However, cases of rickettsialpox may occur in homes where there is no incinerator service. We have observed several such in other parts of the city. In all instances, however, mice harborages existed.

The eradication of the disease where it exists and prevention of its spread depend on the eradication of mouse harborages. Where incinerators are used in a building, they should be fired frequently and thoroughly.

#### SUMMARY

The epidemiologic features of an outbreak of rickettsialpox in a housing development in New York City are discussed. Evidence is presented that the

disease is caused by *Rickettsia akari*; that it is transmitted by a rodent mite, *Allodermanyssus sanguineus*; and that the house mouse, *Mus musculus*, acts as a reservoir. The presence of mouse harborages in the basements was responsible for maintenance of the infection. Incinerators, especially since they were not fired nor cleaned frequently, served as sources of food for the mice and must be considered as a factor in the maintenance of the animal reservoir of the disease.

#### REFERENCES

1. Sussman, Leon N. Kew Gardens' Spotted Fever. *New York Med.*, 2:27-28 (Aug. 5), 1946.
2. Shankman, Benjamin. Report on an Outbreak of Endemic Febrile Illness, Not Yet Identified, Occurring in New York City. *New York State J. Med.*, 46:2156-2159 (Oct. 1), 1946.
3. Greenberg, Morris, Pellitteri, Ottavio, Klein, Irving S., and Huebner, Robert J. Rickettsialpox—A Newly Recognized Rickettsial Disease. II. Clinical Findings. *J.A.M.A.*, 133:901-906 (Mar. 29), 1947.
4. Huebner, Robert J., Stamps, Peggy, and Armstrong, Charles. Rickettsialpox—A Newly Recognized Rickettsial Disease. I. Isolation of the Etiological Agent. *Pub. Health Rep.*, 61:1605-1614 (Nov. 8), 1946.
5. Huebner, Robert J., Jellison, William L., and Pomerantz, Charles. Rickettsialpox—A Newly Recognized Rickettsial Disease. IV. Isolation of a Rickettsia, apparently identical with the Causative Agent of Rickettsialpox from *Allodermanyssus sanguineus*, a Rodent Mite. *Pub. Health Rep.*, 61:1677-1682 (Nov. 22), 1946.
6. Huebner, Robert J., Jellison, William L., and Armstrong, Charles. Rickettsialpox—V. Recovery of *Rickettsia akari* from a Wild House Mouse (*Mus musculus*). *Pub. Health Rep.* (in press).

## Award to Psychiatric Aide of the Year

The National Mental Health Foundation, in order to focus attention on the important rôle played by psychiatric attendants in the care of the mentally ill, to help gain prestige for those engaged in this work, and to encourage better standards of on-the-ward care, announces a \$500 award. This will be made in the fall of 1947 to the man or woman employed as a psychiatric aide or attendant in a mental hospital, who is judged to be worthy of the title "The Psychiatric Aide of the Year." The award will be based on skill, initiative, and imagination in the discharge of duties and kindness and devotion to patients under care. Additional cash awards of \$50 will be given to five nominees deemed worthy of honorable mention.

Nominations will be received from hospitals and one candidate may be nominated for every 1,500 patients on the basis of the July 1, 1947, census.

Neither nurses nor persons engaged in administrative duties may be candidates but only those now employed as psychiatric aides, attendants, charge attendants, or the equivalent and whose activities are directly connected with ward care of mentally ill patients.

The judges will be the following:

- Albert Deutsch, author and journalist
- Robert H. Felix, M.D., Chief of the Mental Hygiene Division, U. S. Public Health Service
- June Joslyn, Executive Secretary, Oregon Mental Hygiene Society
- Mrs. Ruth P. Kuehn, Dean, School of Nursing, University of Pittsburgh
- Dr. Robert L. Sutherland, Director, Hogg Foundation for Mental Hygiene, University of Texas
- Mary Jane Ward, author of *The Snake Pit*

All entries must be submitted before August 31, 1947. Entry blanks and further information may be secured from the National Mental Health Foundation, 1520 Race Street, Philadelphia 2, Pa.

# Inactivation of Partially Purified Poliomyelitis Virus in Water by Chlorination. II\*

SERGE G. LENSEN, PH.D., MORRIS RHIAN, M.S., AND  
MAX R. STEBBINS

*Bureau of Laboratories, Michigan Department of Health, Lansing, Mich.*

THE authors reported in a previous paper<sup>1</sup> the results of their preliminary study on inactivation by chlorination of partially purified poliomyelitis virus (mouse adapted Lansing strain) in distilled water. Suspensions of 0.5 per cent and 0.25 per cent virus were used and the virucidal action of chlorine was tested after contact periods of 30 minutes, 1 hour, and 2 hours. The pH of the samples varied between 7 and 7.4. It was found that in samples with residuals consisting either of free chlorine or of mixtures of free and combined chlorine the virus was completely or nearly completely inactivated in less than 30 minutes. The results with samples in which there was only residual chloramine were not consistent.

The present paper is a report on our further work along the same lines, with the following differences: (1) Shorter contact period (10 minutes, 30 minutes, and 60 minutes) were used for samples with residuals consisting of free chlorine or free chlorine and chloramine, and longer contact periods (2, 3, and 4 hours) for samples with only residual chloramine. (2) The experiments described in the first part of this paper were carried out at the same pH range

as those reported previously, while experiments reported in the second part were carried out at a higher pH range (pH 8.95–9.25).

## TECHNIQUE

Essentially the same technique was used as in our previous work. Therefore, only a very brief recapitulation of the technique is given here. The purification of the virus was carried out as follows: A 10 per cent suspension of mouse spinal cords and medullae in saline was centrifuged in an angle head centrifuge at 3,000 r.p.m. (instead of 1,900–2,000 r.p.m. in a horizontal centrifuge, as done previously) for 25 minutes, then ultracentrifuged at 20,000 r.p.m. for 15 minutes, and finally at 40,000 r.p.m. for 3 hours. The supernatant was discarded and the pellets were rinsed. They were then resuspended in saline and restored to the original volume. After a vigorous shaking in a mechanical shaker, the suspension was cleared by centrifugation at 4,000 r.p.m. for 15 minutes, and the supernatant used either for the experiments or for further purification. The sedimentation of the virus at 40,000 r.p.m. followed by resuspension of the pellet and clearing at 4,000 r.p.m. was considered as a cycle of ultracentrifugation. Where a higher degree of purification was desired, this cycle was repeated once or twice.

\* Presented before the Laboratory Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 13, 1946.

TABLE 1  
Residual Chlorine in p.p.m. After:

Date	Virus Preparation	Chlorine Applied in p.p.m.	10 Minutes			30 Minutes			60 Minutes			Outcome * of Mouse Experiment Injected After:			Controls:		LD <sub>50</sub>
			Free Cl <sub>2</sub>	Chloramine	Experiments with 0.5% purified virus	Free Cl <sub>2</sub>	Chloramine	Experiments with 0.5% purified virus	Free Cl <sub>2</sub>	Chloramine	Experiments with 0.5% purified virus	10 Min.	30 Min.	60 Min.	In Dist. Water	In Saline	
3-11-16 †	1 cycle †	7.0	0.15+	0.45—	0	0.25	0	0.2	0/17	0/20	0/19	0/20	20/20	20/20	0.013%		
3-15-16 †	1 cycle	8.0	0.4-0.5	0.4-0.5	0.1-0.15	0.15-0.2	0	0.2	0/18	0/18	0/20	0/20	18/19	17/18	0.035%		
3-15-16 †	1 cycle	3.0	0	0.5-0.75	0	0.5	0	0.5	9/18	7/20	2/17	9/18	18/19	17/18	0.035%		
3-15-16 †	1 cycle	8.5	0.75	0.65	0.2-0.3	0.2-0.3	0.05	0.25	0/15	0/17	0/20	0/15	18/19	17/18	0.035%		
3-15-16 †	1 cycle	10.0	1.4+	0.6+	0.75—	0.65	0.3-0.4	0.35-0.45	0/18	0/18	0/19	0/18	19/19	15/16	0.028%		
3-15-16 †	1 cycle	2.5	0.75	traces	0.5	traces	0.3	traces	0/18	0/18	0/19	0/18	19/19	15/16	0.028%		
3-15-16 †	1 cycle	3.0	1.0—	traces	0.75-1.0	traces	0.75—	traces	0/18	0/15	0/19	0/19	19/19	15/16	0.028%		
3-15-16 †	1 cycle	6.0	1.0-1.4	0.6-1.0	0.75+	0.65—	0.5—	0.25+	0/17	0/18	0/13	0/18	17/18	19/19	0.0077%		
4-4-16	2 cycles	5.0	0.5-0.75	0.25-0.5	0.2	0.3—	0.05	0.25-0.30	0/17	0/18	0/18	0/18	19/19	13/20	0.021%		
4-4-16	2 cycles	1.5	0.5+	0.25—	0.4+	0.1—	0.3+	0.1—	0/19	0/17	0/19	0/19	19/19	13/20	0.021%		
4-12-16 †	2 cycles	1.8	0.75—	0.25	0.5	0.25	0.45-0.50	0.25	0/19	0/19	0/19	0/19	19/19	13/20	0.021%		
4-12-16 †	2 cycles	1.5	0.05	0.45+	0	0.4	0	0.3—	0/14	0/20	1/15	0/14	14/16	10/14	0.052%		
4-12-16 †	2 cycles	1.2	0	0.4-0.5	0	0.4-0.5	0	0.4-0.5	0/14	0/20	0/18	0/14	14/16	10/14	0.052%		
5-10-16	3 cycles	1.0	0	0.4	0	0.3	0	0.3—	0/20	0/16	0/19	0/18	10/19	7/18	0.163%		
5-10-16	3 cycles	0.6	0	0.3	0	0.3	0	0.3	4/19	1/18	2/20	4/19	10/19	7/18	0.163%		

TABLE 2  
Residual Chlorine in p.p.m. After:

Date	Virus Preparation	Chlorine Applied in p.p.m.	10 Minutes		2 Hours		3 Hours		4 Hours		Experiment Injected After:			Controls:		LD <sub>50</sub>
			Free Cl <sub>2</sub>	Chloramine	Free Cl <sub>2</sub>	Chloramine	Free Cl <sub>2</sub>	Chloramine	Free Cl <sub>2</sub>	Chloramine	2 Hours	3 Hours	4 Hours	In Dist. Water	In Saline	
			Experiments with 0.5% Purified Virus													
4-18-16 †	1 cycle †	3.0	0	0.75	0	0.75	0	0.5+	0	0.5+	0/18	0/19	0/20	18/18	15/17	0.01%
5-15-16 †	1 cycle	1.8	0	0.4-0.5	0	0.4-0.5	0	0.4-0.5	0	0.4-0.5	3/19	1/18	1/18	19/20	15/19	0.034%
5-20-16 †	1 cycle	0.75	0	0.4+	0	0.3+	0	0.3+	0	0.3+	0/17	0/17	0/20	19/20	15/19	0.034%
6-6-16	1 cycle	1.0	0	0.2-0.3	0	0.2-0.3	0	0.2	0	0.2	8/19	1/20	0/18	19/20	15/19	0.018%
6-13-16	1 cycle	1.5	0	0.4	0	0.3-0.4	0	0.2-	0	0.15-0.20	13/18	16/20	16/20	20/20	19/20	0.018%
6-13-16	1 cycle	1.0	0	0.15-	0	0.10-0.15	0	0.3	0	0.3	11/20	5/20	0/17	17/18	18/19	0.014%
6-13-16	1 cycle	1.5	0	0.3	0	0.2-	0	0.15-0.20	0	0.05-0.1	18/19	16/17	12/17	17/18	18/19	0.014%
5-16-16 †	1 cycle	0.75	0	0.15-0.2	0	0.15-	0	0.10-0.15	0	0.15-0.20	10/18	3/18	1/16	17/18	17/18	0.031%
6-7-16	1 cycle	1.0	0	0.3-0.4	0	0.2-0.3	0	0.2+	0	0.2	0/18	0/16	0/17	17/18	17/18	0.031%
6-7-16	1 cycle	0.50	0	0.4-	0	0.3-0.4	0	0.3-0.4	0	0.3-0.4	7/18	5/18	4/20	16/17	15/18	0.046%
6-7-16	1 cycle	0.75	0	0.2+	0	0.15-0.20	0	0.15-0.20	0	0.15-0.20	16/20	16/20	10/19	15/17	19/19	0.031%
6-7-16	1 cycle	1.0	0	0.2-	0	0.10-0.15	0	0.10-0.15	0	0.10-0.15	14/16	9/14	9/18	15/17	19/19	0.031%
6-7-16	1 cycle	1.0	0	0.3	0	0.2-0.3	0	0.2	0	0.2	0/16	1/19	1/18	15/17	19/19	0.031%

\* Number of paralyzed mice over the total number of mice (Paralyzed plus survivors)

† Cycle of purification by fractional centrifugation

‡ 0.1 p.p.m. of ammonia hydroxide added to the distilled water

\*\* 1 drop of 10% suspension of normal mouse brains and spinal cords added to 2 ml. of sample just before injection  
Plus sign (+) after a figure = slightly more than  
Minus sign (—) after a figure = slightly less than

For the chlorination experiments, 100 ml. samples of water were used and the residual chlorine values determined by the orthotolidine arsenite test. For the experiments at the higher pH range a diluted sodium hydroxide-boric acid buffer was used. The temperature of the samples varied between 20 and 30° C. They were tested for virus content by intracerebral inoculation into white mice (0.03 ml.).

#### EXPERIMENTAL

##### A. Chlorination experiments at pH 6.85-7.4

The experiments carried out on the basis of contact periods of 10, 30, and 60 minutes are summarized in Table 1. A 0.5 per cent virus preparation purified by 1 cycle of ultracentrifugation was used for the experiments of March 14 and 15, 1946. In one sample, the residual after 10 minutes contact consisted of 0.5-0.75 p.p.m. chloramine with no free chlorine. There was only partial inactivation of the virus after 10 and after 30 minutes, and some virus could even be detected after 1 hour contact. The residuals in the other samples consisted, after 10 minutes, of mixtures of free and combined chlorine, the lowest value being slightly more than 0.15 p.p.m. free chlorine and slightly less than 0.45 p.p.m. chloramine. In all these samples there was no detectable virus after a contact of 10 minutes.

In the experiment of March 21, 1946, carried out with 0.5 per cent virus purified by 2 cycles of ultracentrifugation, there were only traces of chloramine and 0.75 p.p.m. free chlorine in one sample and slightly less than 1.0 p.p.m. free chlorine in the other. In both cases the virus was inactivated in less than 10 minutes.

Twenty-five hundredths per cent purified virus (1, 2 and 3 cycles of ultracentrifugation) was used for the experiments of March 28, April 4 and 12 and May 10, 1946. In the samples with residuals

containing free chlorine and chloramine, the virus was inactivated in less than 10 minutes. Even in the sample with 0.05 p.p.m. residual free chlorine and slightly more than 0.45 p.p.m. residual chloramine none of the mice injected after 10 and after 30 minutes contact became paralyzed (however, 1 mouse out of those injected after 1 hour developed paralysis).

In the experiments of April 12 and May 10, 1946, there were 3 samples with residuals consisting, after 10 minutes contact, of 0.4-0.5 p.p.m., 0.4 p.p.m. and 0.3 p.p.m. chloramine, respectively, with no free chlorine. In the first two samples there was complete inactivation of the virus in less than 10 minutes. In the third sample (with 0.3 p.p.m. residual chloramine) there was only partial inactivation of the virus even after 1 hour contact.

Another series of experiments was carried out with samples which contained, after 10 minutes contact, residual chloramine and no free chlorine. The samples were tested for virus content after contact periods of 2, 3, and 4 hours. As can be seen in Table 2, there was complete or almost complete inactivation of the virus in less than 2 hours by residuals consisting, after 10 minutes contact, of 0.75, slightly more than 0.4, 0.3-0.4, and 0.3 p.p.m. chloramine (experiments of April 18, May 15, June 13, June 7, 1946). In the other experiments there was either partial inactivation of the virus, or with residuals as low as 0.15-0.20 p.p.m. chloramine, no significant inactivation even after a contact of 4 hours.

##### B. Chlorination experiments at pH 8.95-9.25

Tables 3 and 4 give an account of the experiments carried out at a pH range between 8.95 and 9.25. The outcome of the experiments with samples in which the residuals consisted of free and combined chlorine and in which the virus content was tested after



free chlorine and chloramine should not be excluded. This is not in accord with the interpretation of Ridenour and Ingols who, in a recent paper,<sup>2</sup> seem to attribute the entire virucidal action of such mixed residuals to free chlorine, disregarding the possible virucidal action of chloramine.

In all our experiments carried out at a pH range between 6.85 and 7.4, with residuals consisting of free chlorine and chloramine, the virus in the partially purified suspensions was inactivated in less than 10 minutes. The outcome of the experiments at a higher pH range (pH 8.95–9.25) was different. In some of these experiments there was a complete inactivation of the virus in less than 10 minutes, while in other experiments there was only partial inactivation or no inactivation at all with residuals like 0.1 p.p.m. free chlorine and 0.4 p.p.m. chloramine, or 0.1 p.p.m. free chlorine and 0.65 p.p.m. chloramine (see Table 3). This seems to be in agreement with the findings of Mallmann,<sup>3</sup> Rudolph and Levine,<sup>4</sup> and others concerning the decrease of the bactericidal action of chlorine with the increasing pH. On the other hand, the outcome of the experiments with residual chloramine and no free chlorine (Tables 2 and 4) did not reveal a significant difference depending on the pH.

#### SUMMARY AND CONCLUSIONS

The inactivation of partially purified poliomyelitis virus (mouse adapted

Lansing strain) in water by chlorination has been studied at two different pH ranges. It was found that, at the pH range from 6.85 to 7.4, the virus was inactivated after a contact period of 10 minutes in all samples with residuals consisting of free chlorine and chloramine (even with as little as 0.05 p.p.m. free chlorine). At a higher pH range (pH 8.95–9.25), the outcome of the experiments with such mixed residuals suggests a decrease of the virucidal action of chlorine with the increasing pH: in some of these experiments the virus was not inactivated after 30 minutes or 1 hour in spite of the presence of residual free chlorine. In samples with residual chloramine and no free chlorine, no significant difference in the virucidal action was found depending on the pH. In spite of a certain inconsistency, the results of these experiments indicate that residual chloramine values of 0.5–0.75 p.p.m. usually inactivate the virus in less than 2 hours, while residual chloramine values of 0.2 p.p.m. or less fail to inactivate the virus.

#### REFERENCES

1. Lensen, S. G., Rhian, M., and Stebbins, M. R. The Inactivation of Partially Purified Poliomyelitis Virus in Water by Chlorination. *J. Am. Water Works A.*, 38:1069, 1945.
2. Ridenour, G. M., and Ingols, R. S. Inactivation of Poliomyelitis Virus by "Free" Chlorine. *A.J.P.H.*, 36:639, 1946.
3. Mallmann, W. L. Hydrogen ion Concentration in Disinfection by Chlorination. *J. Am. Water Works A.*, 24:1054, 1932.
4. Rudolph, A. S., and Levine, M. Factors Affecting the Germicidal Efficiency of Hypochlorite Solutions. *The Iowa State College Bull.* 150, 1941.

# Community Education in Hawaii Through Health Surveys\*

RAYMOND GEORGE NEBELUNG, DR.P.H.

*Executive Director, Public Health Committee, Chamber of Commerce of  
Honolulu, Honolulu, T.H.*

**M**OBILIZING community support for the conduct of our varied health programs constitutes one of the major issues with which we are confronted today. One of our greatest obstacles lies within our own ranks when we find both official and voluntary agencies competing with one another, often working at cross purposes, and vying for public recognition. Too frequently we become so engrossed with our own work that we are apt to lose sight of its relationship to the overall community health needs. This is to be expected inasmuch as all our energies in many cases are centered upon a particular problem. Consequently, not infrequently many of our more important but less spectacular problems receive little consideration, while those with a strong emotional appeal get more attention than they deserve.

If we are to continue to have public support in the way of increased appropriations we must begin to stress and focus attention on these issues. We must also secure more lay participation in the planning and conduct of our activities. Only through such coördinated effort can we hope to eliminate confusion in the public mind as to what problems should be given priority. Our education programs should be so con-

ducted that all our energies and funds are spent in a judicious manner. There can be no dispute over the need to arouse in the individual an interest in the maintenance of his own personal health as well as that of his community.

One of the most unexploited segments of our population is that of business. Here neither the official nor the voluntary agency has made a sustained effort to utilize either its personnel or its resources. Many business organizations on their own initiative have set up elaborate health programs for employees because they recognize the economic and social values to be derived from these services. More recently we find chambers of commerce establishing permanent health committees and taking an active part in support of our varied programs. With proper leadership, this group can become a potent force for improving the health of our people. Our job is to see that they are properly informed and that their energies are directed into the right channels.

The Chamber of Commerce of Honolulu is offering practical and professional leadership in support of health work in the Territory of Hawaii. The history of its activity dates back to 1900 when the business community first took an active part in a serious outbreak of plague in the city. Throughout its long history the Chamber's Public Health Committee has sponsored numerous new projects and has given active assistance to both

---

\* Presented before the Public Health Education Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 12, 1946.

official and voluntary health agencies. Some of the projects which it has initiated and financed include rat and mosquito control activities, public health nursing, mental hygiene, and a school health workshop. It has also sponsored periodic surveys directed by prominent mainland specialists in the fields of community health, mental hygiene, tuberculosis, and sanitation. Committee members have likewise participated actively, and in numerous instances assumed leadership in these projects.

The Public Health Committee consists of 21 members appointed by the board of directors upon the recommendation of the committee chairman. Monthly meetings are held to discuss current problems, to review staff activities, and to study the progress of standing committees. The committee is assisted by an advisory group of five persons consisting of representatives from medicine and welfare organizations, supplemented by members of its own group. The function of this group is to review proposed new projects that are submitted to the committee for financial support.

The committee has long recognized that a high standard of community health is an important economic asset. It also recognizes that public health today has become big business with many ramifications, which not only embraces prevention of disease but involves care of the sick. Therefore it was not unusual when the Chamber, in August, 1944, organized a community health survey consisting of 17 committees with 34 subcommittees. More than 275 men and women representing business, the clergy, education, professions, and welfare organizations were enlisted in this undertaking. The objectives were to review and outline existing health problems, community resources and services, and on the basis of findings, to make recommendations for the expansion of services and to inaugurate new programs to meet

the unmet needs. The project was originally set up as a part of the Chamber's overall post-war planning study, with the president of the Territorial Board of Health as chairman.

It soon became evident that the direction of such a comprehensive undertaking would require full-time personnel. The Public Health Committee which was already engrossed in the hospital phase of the survey finally decided to recommend to the board of directors that a paid staff be employed to assist with its own activities and to direct the survey. This was done and a staff of trained public health personnel consisting of an executive director, health educator, research statistician, executive secretary, and clerical assistant was provided in February, 1945. Following employment of a staff all post-war health studies were transferred to the Public Health Committee.

A steering group was appointed to review progress of the various committees and to approve final reports prior to their publication. The president of the Territorial Board of Health serves as chairman of the group, which is augmented by one representative each from medicine, welfare, and the executive director of the Public Health Committee staff. The latter serves as liaison and consultant to the various study committees. Weekly meetings are held to review progress and to make suggestions to the liaison representative in order to facilitate and guide the course of studies. A mimeographed form is used to insure uniformity in making outline reports of progress.

Approximately six months were spent in organizing and outlining the studies of the different committees. In most cases the members of these committees are leaders in their respective fields. A regular schedule of meetings is followed until completion of their assignments. Data collected by designated persons with the aid of the staff are assembled

on progress forms by the latter and circularized to the other members. The material, which includes information regarding legal status, facilities, personnel, and programs, is then used as a basis for discussion in committee meetings. After the collection and compilation of data has been completed, committee recommendations are made in terms of immediate and long-range needs. A tentative final report in outline form is then submitted to the steering committee for review. The study committee chairman meets with this group which advises, offers suggestions regarding changes, and finally refers the report back to its committee for further consideration. The final revision is submitted again to the steering group for approval both in outline and narrative form. The purpose of the outline is to enable anyone readily to appraise the status of a particular service along with recommendations of the study committee without having to peruse the entire report.

Reports are issued as the work of the particular committee preparing them. Individual recommendations are considered to represent the views of the committee as a whole. Any dissenting opinions are likewise published upon request of a committee member.

The following studies have now been published: *Healthful Housing for the Territory of Hawaii*, *Public Health Organization and Administration for the Territorial Board of Health*, *Hawaii's Sanitation Problems* and school health programs. Remaining reports will be completed by the end of 1947.

Educational implications emanating from the survey have been very significant. Through joint planning we have achieved a more sound basis for improved working relationships among all groups. Likewise the association with persons of diverse education and experience backgrounds has enlarged the outlook of many. Be-

sides, it has developed in them a greater sensitivity toward resolving our health problems, and also has revealed many inherent weaknesses in our present health services.

Realizing that much of the survey value as a health education medium would be nullified unless an organization were established to bring into effective working relationships all the different forces and services that concern health, the Chamber of Commerce Public Health Committee again took the initiative and in September, 1945, organized the Oahu Health Council. Valuable information concerning community resources and local problems is now being made available, defining unmet needs along with plans for new programs. Therefore the next logical step was to focus public attention on these needs through a sustained and coördinated program of education in which all parties concerned might have an opportunity to participate.

The organization pattern is similar to that of councils which operate in mainland cities, with one exception, namely, that the executive director of the Public Health Committee serves as its permanent secretary. He and his staff are charged with the responsibility of carrying out the Council's mandates. The health educator on the staff devotes full time to Council affairs. Emphasis is placed upon group planning under professional direction with volunteer lay participation. Fifty-two organizations presently hold membership in the Council.

Prior to and after publication of a post-war health study, periodic digests appear in the press. These reports are then referred to the Community Education Committee of the Oahu Health Council whose function it is to motivate the community to put into effect the recommendations of the study committees. All types of educational media are utilized, including press

releases, radio, group discussion, and a monthly bulletin.

Specific accomplishments resulting from the combined activities of the health survey and the Oahu Health Council include adoption of the administrative reorganization plan proposed for the Territorial Board of Health which has already been augmented by additional services and personnel; inauguration of a school health workshop at the University of Hawaii; and sponsorship of a tuberculosis "field day."

The health survey is providing us with a blueprint that can be used for some years to come by all agencies in

the development of their programs. In the Oahu Health Council we now have the necessary machinery to supply to the public information on all health work in the community, a means of keeping survey reports alive, and a coördinating center dedicated to group planning.

Hawaii's overall health record today compares very favorably with that of most states. Fortified with these new instruments, we look forward to a time in the not too distant future when the Territory will occupy an enviable position in all phases of health promotion.

### Best Sellers in the Book Service for June

An Appraisal Method for Measuring the Quality of Housing: A Yardstick for Health Officers, Housing Officials and Planners.		
Part I Nature and Uses of the Method.	1945.....	\$1.00
Part II. Appraisal of Dwelling Conditions.	1947.....	5.00
The Control of Communicable Diseases, 6th ed.	1945.....	.35
Diagnostic Procedures and Reagents, 2nd ed.	1945.....	4.00
Fleas of Western North America. C. A. Hubbard.	1947.....	6.00
Penicillin Therapy. J. A. Kolmer. 2nd ed.	1947.....	6.00
Preventive Medicine and Public Health. W. G. Smillie.	1946.....	6.00
Proceedings of the National Conference on Local Health Units. September 9-13, 1946, Ann Arbor, Michigan. Supplement to the American Journal of Public Health, January, 1947. Covered.....		1.00
Standard Methods for the Examination of Dairy Products. 8th ed. 1941. Paper.....		2.00
Swimming Pool Data and Reference Annual. 14th ed. 1946.....		3.00

Order from the Book Service  
 AMERICAN PUBLIC HEALTH ASSOCIATION

# Regionalism as a Tool for Research and Social Engineering\*

JOHN E. IVEY, JR., PH.D.

*Division of Research Interpretation, Institute for Research in Social Science,  
University of North Carolina, Chapel Hill, N. C.*

REGIONALISM is an elusive idea. It appears as part and parcel of a variety of modern action and research programs and literature. The geologist, geographer, ecologist, political scientist, sociologist, public administrator, economist, and psychologist, to mention a few professions, all have found the regional concept useful. It seems to be everywhere at once, and therefore confounds attempts to nail the idea down for systematic study, description, and evaluation.

Why should the region, as a concept, be so generally used? For one reason, the region is a geographic concept which sets off one or several characteristics of the particular area with which the investigator is concerned. As the natural and social sciences have become more concerned with describing the spatial aspects of the phenomena with which they deal, the method of delimiting the distinguishing phenomena within regional boundaries has become more popular. In this manner, regional areas with differing, as well as similar, characteristics can be identified, contrasted, and compared.

It is obvious that there can be as many different types of regions as there are special characteristics of the environment being investigated. To put it another way, there can be as many

different regions as there are different purposes for delimiting them. Here we have the idea of the region in its most diffused manifestation: an area delimited on the basis of the homogeneity of one factor or aspect of environment. In this type of regional study the major focus is in finding the patterns which characterize the geographic occurrence of the particular phenomena being studied. From the scientist's viewpoint there are two general types of characteristics which are considered in delimiting these areas.

First, there are the phenomena of the natural environment: for example, water and land masses, topography, soil types, atmospheric pressure, temperature, humidity, rainfall, plant and wild life habitats, mineral belts. Second, there are the phenomena of the human social environment: for example, agricultural plant and animal habitats, demographic factors, mining, industry; factors of social organization, such as institutions, cultural values and attitudes, trade, and administrative factors.

In contrast to the single factor region, there is the composite region: an area delimited on the basis of homogeneity or similarity of a large number of factors. Composite regions are of two general types: natural regions and human use regions. The various natural and human social factors mentioned above, when related in these two categories, reflect composite patterns of environmental characteristics.

\* Presented before the Health Education Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 13, 1946.

The human use region is frequently called a cultural region. In effect, the human use region reflects the merger of man's energy, purpose, and ability with the materials and forces of the natural environment. In this sense the cultural landscape, characterized by patterns of agriculture, industry, transportation, communication, and settlement, reflects a synthesis of the human and non-human factors of environment.

The delineation of composite regions, both natural and human use, represents a concern with identifying regions *per se*. Delineation of single factor regions, for the most part, represent concern with the geographic occurrence of the phenomena.

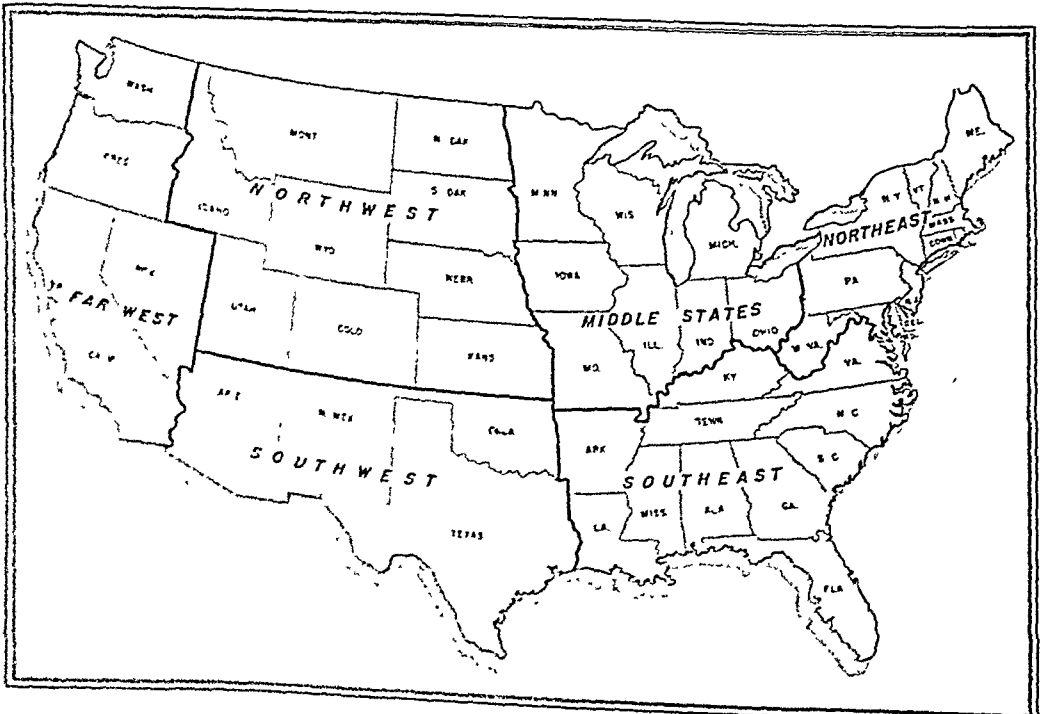
There can be many different types of human use regions set off on the basis of the relative area they encompass. Frequently recognized and used are concepts of metropolitan regions, e.g., New York, Chicago, Cleveland; administrative regions (the federal government has

more than 100), and group-of-states regions.

Howard W. Odum has developed for the United States the most widely recognized delineation of composite group-of-states regions.<sup>1</sup> Professor Odum groups the forty-eight states into six major regions: the Northeast, Southeast, Middle States, Southwest, Northwest, Farwest (see Figure 1). In forming these groupings, Odum used more than 300 statistical indices covering the various aspects of the natural and social environments.<sup>2</sup> In the remainder of this paper, we will refer primarily to this type of composite group-of-states regions.<sup>3</sup>

This brief and oversimplified discussion of types of regions should serve to show the scope and depth required in a scientific approach to regionalism. But now the plot must thicken. Single factor regions and composite regions, when depicted on a map, are akin to a snapshot or still photo of the realities at the

MAP 1



time and in the place so described. In regionalism, however, we are interested in the life processes in motion within areas. Our mode of thought now must be changed from the snapshot to the equivalent of the motion picture.

Regionalism, as a science, is concerned with the measurement of existing environmental capacity, and with the social engineering of potential engineering of potential environmental capacity.

It is held that the scientific delineation of composite human use regions identifies areas within which there is the greatest possible *unity of operation* among the natural and social factors present. The capacity of the regions, so delimited, is dependent upon the quality and quantity of the life-sustaining materials and forces in the area.

#### THE REGION AS A UNIFIED BEHAVIOR SYSTEM

To measure the existing and potential capacity of a region, the scientists have to deal with two major behavior systems: the materials and forces of nature, and the social materials and forces. Man is included as a factor in both systems.<sup>4</sup>

##### *The Materials and Forces of Nature*

Every life supporting area of the earth has a measurable capacity for the production and maintenance of plants and animals. The ecologists tell us that these areas possess a community of plant and animal life which exists in a dynamic system. The sun, land, and water provide the medium. The process of photosynthesis, the hydrologic cycle, the food chains, the processes of invasion, competition, succession, and climax growth, are all a part of the reproductive and decay cycles of these areas.

As long as these areas are left undisturbed by man, they tend to reach a biologic balance. This is a state where the various living bodies of the environ-

ment remain in a system which maintains a productive equilibrium of living organisms in their relationship to one another, and to the sun, water, and land.

Natural environment thus is an energy system. Solar energy is trapped by plants which in turn draw inorganic elements from the soil and make them available in digestible form for the animal life. The plant and animal life represent the current *flow* of organic energy. Water force in streams and rivers represents the current *flow* of potential inorganic energy. The remains of past generations of plant and animal life have become, through ages of geologic processes, our *store* of organic energy in the form of coal, oil, and their related substances.

Each natural environment has a tempo, or rate of time, in which the reproductive process—the growth to maturity, and finally the death and decay of its living bodies—takes place. The tempo of the natural environment is geared to the life cycles of plants and animals, to the requirements of living organisms reacting to the inexorable forces of the climate and seasons. It is, therefore, a tempo largely geared to biological processes taking place in nature's medium of sun, water, and land.

These factors, and many others, are areas of investigation into which our biologist, botanist, zoölogist, plant and animal ecologist, chemist, geographer, and many other physical scientists must blend their judgments. For only through achieving an understanding of the unified behavior system of the natural environment can man build a permanent system of human social life.

##### *The Materials and Forces of Society*

Primitive man, with his simple wants, and his crude technology of fire and stone, fitted rather harmoniously into the biological equilibrium of the life



supporting areas where he settled. Modern man, with his complex wants, his glittering gadget civilization, and his work-monsters of fire and metal, can almost overnight destroy the biological equilibrium of nearly any environment he chooses to invade.

Men have created systems of social organization to furnish the necessary materials and experiences to meet their wants. The pattern of wants possessed by social groups directs their use of technology in fabricating and consuming the gifts of nature. Human wants are the caps, so to speak, which fire the processes of individual and group action. These multitudes of action patterns operate in systems of social values and attitudes which serve as guiding or controlling forces to give group life order and direction. These action patterns are further crystallized and thus shaped and driven, through such institutional systems as government, business, religion, family, and education.

The systems of group life, unlike the systems of the natural environment, are not set primarily to a biological tempo of reaction. By virtue of man's longer life span, his greater mobility in time and space, reasoning, language, and other such factors, social systems have a tempo of activity geared primarily to psychological factors set within a cultural framework.

The social environment can also be viewed as an energy system. The intensity of individual wants, the degree to which they find satisfaction and expression through group channels, the methods for and frequency of group action, the restraining or facilitating effect of group attitudes and values, the degree of group consensus on objectives and methods—all of these things condition the nature, force, and tempo of group activity. They affect the flow of biological and psychological energy of each individual into the social energy of group action. The existing capacity

of the social environment to meet human wants can be measured in terms of the resulting quality of health, personal and social adjustment of individual and groups, level of income, level of education, and other such factors.

In broadening the scope of group life, man has wrought great and important changes in the natural environment. In many areas he has partially replaced nature's system of plants and animals with those of his own choice. His methods of agriculture and industry have begun to strain severely, and frequently upset, nature's productive balance. The land is stripped of its cover and exposed to the fury of winds and rain. Wild life habitats are thus destroyed. Erosion fills the streams and rivers with silt, the air with dust. In such cases, the tempo of the social system has far exceeded the tempo of the available energy systems in the natural environment. The energy demands of society have exceeded the available energy supply of nature.

But in spite of his powerful and fast-moving civilization, man remains basically a creature of biology. As such, his rate of reproduction, span of life, and final appointment with death fit rather neatly into systems of prediction. His fertility, health, longevity, and cause of death are woven into a reciprocal relationship with his mode of work, concentration of numbers, level of education, level of economic achievement, and other similar factors.

#### *Man: The Connecting Link Between Nature and Society*

Each individual is thus a power center, or energy system. Through his behavior, the process of energy expression, he weaves his own purpose and ability into the social systems and into the forces and materials of nature. The energy system of the natural environment and the energy system of the social environment are related to one an-

other by the procedures through which individuals and groups channel the expenditure of human energy.

These systems of social behavior are becoming more and more susceptible to measurement, description, analysis, and guidance as the tools of the social scientist become more precise. The physiologist, neurologist, psychiatrist, psychologist, sociologist, anthropologist, economist, political scientist, educator, and public administrator here find fields of investigation which require a synthesis of judgment.

Thus within each composite human use region, there are two behavior systems in operations as one unit: the forces and materials of nature and the forces and materials of society. The capacity of each is, in part, a function of the degree to which they complement one another. Total regional or environmental capacity, in final analysis, is determined by how effectively the social system is organized to facilitate the maximum expression of human energy on the one hand, and to develop and sustain the energy producing capacity of the natural environment on the other hand.

At this point it should be clear that the process of measuring the productive capacity of a region requires methods of team research. To evolve an accurate picture of the reciprocal relationship between the complex systems operating in the natural and social environments, experts in natural and social science must be called on to *unify* or *synthesize* their judgments. Regionalism as a science of social engineering can be no more accurate and effective than the unity of theory, and the measurement of environmental capacity from which it proceeds.

#### DEVELOPING REGIONAL CAPACITY

Given certain soil types, climate, topography, minerals and wild life, what kinds of human use activities will

achieve the highest quality of sustained productivity of a particular region? In the same area, given the existing state of economic and social organization, the pattern of human wants, the social values and attitudes of the people, what educational and administrative methods will help the people to secure and sustain a higher level of living?

These questions represent the propositions which have to be translated into social objectives, social policy, administrative machinery, and action programs if the environmental capacity of an area is to be realized. It is at this point that regionalism, as a science for measuring environmental capacity, must call upon regionalism as a science of social engineering.<sup>5</sup>

Man is the link between the materials and forces of nature and the materials and forces of society. He is at once a creature of biology and culture, but also is a creator and transmitter of social systems. His manner of behavior as a force in society is for all practical purposes *acquired* or learned. In this sense, given an adequate natural environment, the quality of life that a region supports reflects the quality of scientific information and social values transmitted to and expressed by its inhabitants.

The bedrock of any society is the quality of nature's forces and materials, and the physical and mental health of the people. But the flow of human energy into productive and satisfying channels of expression is dependent upon how the social system is organized.

The scientific objective of social engineering is twofold. It aims to invent and assist in setting into motion systems of group activity which (1) gear the energy demands of the social system to the energy supply of the forces and materials of nature; and (2) achieve maximum development and expression of individual energies in satisfying and socially productive pursuits. Group processes and organization are media for facilitat-

ing the social expression of individual wants. The power or importance of group activity depends on the general level of acquired individual competence and degree of individual participation in social action.

Social engineering, then, is concerned with methods for facilitating the most effective outflow of individual energies into group expression. It must likewise master methods for facilitating the individual and social intake of scientific information necessary to guide individual and group activity into higher levels of welfare.

Regionalism, as a science of social engineering rests on the premise that new democratic systems of group activity within an area must spring from decisions of and action by the people. These new democratic systems must be rooted within, and be built out of existing patterns of group association and leadership. For only in this way can there be effected any organic and lasting change in a region.

Social engineering has three phases: planning, organization, and administration. Within a composite group-of-states region, these three phases are essentially educational processes.

### *The Planning Process*

In planning, there are matters of design and layout of human occupancy patterns in the region, farm layout and management, water control and utilization, transportation and communication systems, layout of small communities and larger metropolitan areas into trade, manufacturing, residential, and recreational centers.

A basic part of the design pattern, however, is the pattern of social objectives which individuals and social groups decide upon. What kind of agriculture, what kind of industry, what kind of educational, health, and security services exist? What kind of government, what kind of business system are pres-

ent? The answers to these questions define a pattern of group wants which in turn shape the selection of alternatives for design and use of nature's materials and forces.

Obviously, such group decisions do not spring clear and loud from one gigantic public debate. They must evolve, sometimes slowly, sometimes rapidly, but always out of organizations and social systems of the area to be developed. To the extent that group decisions are based upon the results of regional research, the gearing of social systems with systems of nature will be closer. At this point, planning begins to blend with organization and administration.

Since the 1930's there have been in the United States at one time or another, as many as forty-five state planning boards. With few exceptions, these boards have worked as research organizations, having little or no functional relationship to the administrative agencies of state government. They have recommended plans but the process of bridging the gap between plans and social action has been, according to heads of thirty-five state planning boards, rarely achieved successfully.<sup>6</sup>

There is considerable evidence that the key to this failure rests in the abstraction of the so-called planning process from the process of state administration. A similar conclusion as to the cause for the failure of many city planning boards has been advanced by Robert C. Walker in his study, *The Planning Function in Urban Government*.<sup>7</sup>

In this connection, it is significant that the Tennessee Valley Authority, the most singularly successful regional planning agency in the world, has no separate planning board or division. The planning function is a part of the administrative process.

One principle here is that the planning process might well be used as an

administrative method for bringing the experts and the people into a new relationship, one which is essentially educational for all concerned. Only in this way can the layman's decision on social policy, or on how to meet his day to day problems of living, be flavored with the scientific information of the expert. Similarly, only through physical face-to-face contact with people's needs, where they occur, can the experts' judgments be tempered into consistency with social realities.

The process of group planning on the community, state, or regional level should be viewed as sowing the seed of social action, because if consensus is not reached at this point, through achieving an understanding of the issues and a clear choice of path of action, at some future point the lack of effective individual participation in group action will likely spell the failure of the enterprise.

### *A Regional Integrating Facility Is Essential*

Out of the planning processes the new organizational forms grow, if any are needed; and the process for more integrated administration evolves. But unless there is some machinery for achieving the integration of the several phases of regional development, such a unified pattern will not be likely to evolve.

The Tennessee Valley Authority provided such machinery for its river valley region. The directors of the TVA have skillfully woven their program into the institutional structure of the Valley. Their philosophy and method differ little from the one just described.

But in the large southern United States, there has been no such integrating machinery. And there has been no amazing social progress such as can be witnessed in the Valley of the Tennessee. Today, however, the South offers one valuable case study of how, on a

rather high level of administrative organization, an attempt was made to provide educational and research agencies concerned with resource development with an integrating regional facility. It offers one example of how processes of regional development can be set in motion.

Since the late 1920's there has been accumulated an increasingly large volume of research dealing with the status and potentialities of the South's human, natural, and social resources. Today the South is probably the best documented area in the United States. In spite of much good work carried on by various federal and state agencies, as late as 1943 there was considerable question as to whether the great reservoir of research information was finding its way to the people who need it.

At that time, the American Council on Education appointed a Committee on Southern Regional Studies and Education, made up of research and educational experts, for the purpose of investigating this problem and recommending a course of action. This committee, rather than conduct the study by itself, invited thirty-eight influential educators, research specialists, and administrators to join with it in a regional conference at Gatlinburg, Tenn.

In short, it was found that the great masses of southern people were set apart from the existing wealth of facts. The reading level of books and pamphlets dealing with agriculture, housing, health, and other such problems was far above the reading ability of the people. There were few adequate textbooks on regional resources for public school students and teachers. And, perhaps most difficult of all, research and educational experts were not accustomed to working systematically with one another to see that each made his most effective contribution to public welfare. Badly needed were new methods and media of mass communication. The public

schools, the institutions of higher learning, and adult education agencies needed to make great strides to increase their effectiveness in advancing the competence of the people to use their potential resources. A new agriculture, new industry, better health, housing, and social relations were possible only if the people could find skill and opportunity to develop and release their energies.<sup>8</sup>

The committee, while continually working with groups of state agencies, set up a second Gatlinburg Conference. This time, 115 specialists in research, education, and administration came as official representatives of their respective agencies and institutions. There were 20 official representatives of regional agencies. The group studied the earlier findings, developed specific plans for cooperative regional projects for production of educational materials, teacher education programs, cooperation among resource development agencies and the public schools and colleges, and other such topics. Representatives from the states worked a part of the time as teams, evolving specific plans of action to begin on their return home.<sup>9</sup>

Through the process described here, increased interest and more effective action in resource development have evolved in the South. In each state and among the several states, a new pattern of concern over resource development is clearly evident. Today more than 650 state agencies and institutions and 38 regional organizations in the fields of research, education, administration, and industry are, through cooperative action, slowly weaving a new fabric of regional cooperation.

To do this, southern agencies have developed specific new tools of communication.<sup>10</sup> The Southern Educational Film Production Service, located at the University of Georgia, but created and controlled by a regional board of directors, has been established. A Regional Materials Service has been set

up at George Peabody College for Teachers. A cooperative Regional Training Program in Public Administration is operated from the University of Alabama. Serving as a central clearing house and service agency in education for resource development, the Committee on Southern Regional Studies and Education has been put on a permanent operating basis. Its central office is located at the University of North Carolina, with other staff services provided by the University of Kentucky, George Peabody College for Teachers, and the Tennessee Valley Authority. The committee publishes a quarterly newsletter, *Resource-Use Education*, sponsors a Regional Training Program in Resource-Use Education, holds special institutes and conferences for state and regional groups, and furnishes consultation services to other state and regional agencies.

This program has drawn heavily on the "know how" of TVA. One ingredient the committee added was a broadened idea of resource-use education.<sup>11</sup> Rather than administer a program with new personnel and new machinery, it set out to induce the resource-use education idea to become a part of the philosophy and program of the multitude of agencies and institutions serving the region. The committee thus serves primarily as a facility for achieving cooperation among state and regional groups in research and education. The processes of regional integration were set into motion.

The objective and method of weaving new patterns of life into the productive system of the natural environment can be viewed as building from the specific to the general. In effect, it moves from the individual to the group, from the small group to the community, the community to the county, the county to the state, the state to the group-of-states regions, the regions, to the nation, and hence into world regions and the entire world.

Obviously regional programs are not set up that way but they can be administered in such a manner.<sup>12</sup> Given the regional integrating facility, the job becomes one of facilitating the flow of human energy through channels of expression in rural areas, in communities, on the farm, in the factory, in the church, and in the colleges and universities.

Dictatorships pass ideas and initiative from top to bottom, from elite leaders to herds of followers. This may be the quickest and temporarily the most effective method. Democracy must thrive on ideas springing from masses of people who, in turn, act in accordance with their own group decisions administered by their own chosen leaders.

#### *Regional Development and the Educational Process*

Planning, organization, and administration, as three phases of social engineering in a regional framework, can thus be seen as a broad process of public education. It aims to assist masses of people to act on information consistent with the resource-use principles and practices which science identifies as essential to the achievement of the maximum productive capacity of the region.

First, there must be a systematic flow of scientific information to the people through scientifically devised and used media and methods of mass communication. The important points of leadership in a regional fabric of effective communication with people include newspaper editors, radio experts, civic clubs, ministers, county farm agents, college professors, personnel of state and county health departments, state departments of conservation, state planning boards, state departments of education, and other such groups.

The agencies mentioned here also make up the major fabric of social

action in a region. The second phase rests on the extent to which these agencies or organizations succeed in integrating their efforts and those of the people into patterns of coöperative activity consistent with scientific information.

Both of these jobs go on concurrently and are continuous. A region is a dynamic, changing organism. Processes for its development must also be dynamic. Regional designs are kept in the process of constant change and adaptation by the integrating facility, such as a regional planning or development agency. Plans then serve merely as points of departure and general guides from which to work.

It has been noted that research to measure regional capacity is a team enterprise for natural and social scientists. Similarly, the planning and administration involved in achieving full environmental capacity is a team enterprise for research, education, and administration.

#### REGIONAL CAPACITY AND NATIONAL WELFARE

The United States is a nation of regions, as well as states. To the extent that the public administration of national programs flows only from Washington to the hinterland, the people and their local and state agencies and institutions will become progressively weakened. But likewise, the nation will become weakened if the people and their local agencies and institutions do not find the motivation and skill to cope with their problems in the broader regional, national, and international framework.

Regions serve as intermediary areas between state and nation. This provides a medium for decentralization in both formulation and administration of national programs. They serve as a framework for the integration of a stronger national welfare. Each region, both for its own welfare and the na-

tion's, must develop those economic and social patterns based upon resources, which make it best qualified to contribute to the nation and the world.

The systematic development of the total regional resources of America is the next great frontier in the task of applied science and government. The overall regional administrative framework probably will be slow in taking shape. Those agencies and leaders who believe that the strength of a democracy lies in the power of its people can begin to shape their public service programs toward releasing that power. The processes of regional development, from the scientist's point of view, are the processes of developing the health, initiative and skill of our people within the framework of their natural and social environment. If the spirit and the method of this point of view permeate the programs of all our agencies of public service, the composite regional framework may follow. This type of evolution would be a fitting symbol of the democratic process.

#### REFERENCES

1. Regional boundaries are not conceived as sharp dividing lines between two areas. In fact, the exact lines of differentiation are more frequently drawn because of statistical or administration exigencies.

2. For more details on methods used in regional delineation, see Odum, Howard W., *Southern Regions*

*of the United States*. Chapel Hill: University of North Carolina Press, 1936, Chapters II, X. Also, pp. 662-668. Odum, Howard W., and Moore, Harry E., *American Regionalism*. New York: Henry Holt, 1938, *passim*. National Resources Committee, *Regional Factors in National Planning*. Washington: U. S. Government Printing Office, 1935, *passim*.

3. The importance and usefulness of natural and social subregions should be emphasized. They are treated in above mentioned references, but a more detailed presentation of a method for their identification is given in: Mangus, A. R., *Rural Regions of the United States*, A report of the Work Projects Administration. Washington: U. S. Government Printing Office, 1940, Chapter IV.

4. A detailed treatment of this point of view is being prepared by the author in a volume entitled, *Resources for Social Engineering*.

5. Cf. Vance, Rupert B., *Human Geography of the South*. Chapel Hill: University of North Carolina Press, 1932, Chapters XVII-XVIII.

6. From a study by the author now in preparation as a volume, *Democracy on Trial: Experiments in American State Planning*.

7. See Walker, Robert A., *The Planning Function in Urban Government*. Chicago: University of Chicago Press, 1941.

8. See Ivey, John E., Jr., *Channeling Research into Education*. A Report of the Committee on Southern Regional Studies and Education. Washington: American Council on Education, 1944.

9. Committee on Southern Regional Studies and Education, *Education for Use of Regional Resources*. A Report of the Committee on Southern Regional Studies and Education. Volume II. Washington: American Council on Education, 1945.

10. These developments are described in detail in John E. Ivey, Jr., and Harry B. Williams (Editors), *Education Helps Build a Region*. A special issue of the *High School Journal*, Vol. 29, No. 3. Chapel Hill: University of North Carolina Press, 1946.

11. See Ivey, John E., Jr. Resource Education: A Tool for Regional Development. *The 1945 Official Report of the American Association of School Administrators*. Washington: The National Education Association, 1945, pp. 158-169.

12. For an excellent discussion of "decentralized administration of centralized authority" see Lilienthal, David E., *TVA—Democracy on the March*. New York: Harper and Brothers, 1945, Chapter 14.

## Medical Bibliographies Available

A series of selected bibliographies on medical care has recently been established by the Subcommittee on Medical Care of the Committee on Administrative Practice. Bibliographies on *Chronic Disease and Hospitals and Health Departments* have been prepared and are now available. The subcommittee also

has a limited supply of some of the publications listed in these bibliographies which will be distributed to those desiring them.

Requests for copies of either of the bibliographies should be directed to the Subcommittee on Medical Care, P. O. Box 5998, Bethesda, Md.

# Regionalism in Relation to the Health of the Public\*

CARL W. STROW, PH.D.

*Research Council for Economic Security, Chicago, Ill.*

HEALTH is an important factor in the efficiency and happiness of a people—consequently, it is valuable to measure it. Direct indices of health are death rates, mortality from particular diseases and groups of diseases, morbidity, disability rates, organic defects. The available data for these indices vary in completeness, accuracy, and efficiency as units of measurement. Besides, there are many indirect indices of health which include cultural elements related to health. There is no one perfect index of the state of health and, therefore, the health indices available must be employed as only approximate indicators.

## HEALTH-SANITATION RANKING OF THE STATES

In a recent study,<sup>1</sup> an attempt was made to compile data for indices of health and health-related factors. A total of twenty-eight indices were set up which were thought to have some bearing on health problems. A health-sanitation index for the various states was constructed from infant death rates, death rates from tuberculosis, death rates from infectious and contagious diseases, and prevalence of sewerage connections and defective housing. The data used for this index were taken from the year 1940, since more complete material is available for that year and

it may also be considered as a pre-war year. It will be interesting to construct the averages for war years and especially for the first post-war year after economic and population readjustments have taken place. Changes in health institutions and programs as well as migration of population may change the future rates and ranking of the states in health status from those of 1940. Table 1 and Map 1 show the rank of states by quartiles and show a decided regional

TABLE 1  
*Health-Sanitation Rank of States—1940*

State	Rank	State	Rank
Conn.	1	S. Dak.	25
Wash.	2	Ida.	26
Ore.	3	Mont.	27
Mass.	4	Colo.	28
N. J.	5	Ind.	29
N. Y.	6	Mo.	30
Ill.	7	Me.	31
R. I.	8	Ariz.	32
Minn.	9	N. Dak.	33
Calif.	10	Fla.	34
Pa.	11	W. Va.	35
Nebr.	12	N. Mex.	36
N. H.	13	Okla.	37
Utah.	14	Tex.	38
Mich.	15	Va.	39
Dela.	16	La.	40
Wisc.	17	Tenn.	41
Iowa.	18	Ga.	42
Ohio.	19	N. Car.	43
Kan.	20	S. Car.	44
Nev.	21	Miss.	45
Wyo.	22	Ky.	46
Md.	23	Ala.	47
Vt.	24	Ark.	48

distribution of the rankings. The table ranks the state with the most favorable health conditions as number 1 and so on to 48. These rankings are for data in the year 1940 and are also subject to the shortcomings of the ranking methods. In terms of this health-sanitation in-

\* Presented before the Health Education Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 13, 1946.



dex, there are conspicuous characterizations by regions. All states except one of the southeast region are in the fourth quartile. While two states of the southwest region are in the fourth quartile and two are in the third quartile, 89 per cent of the population of that region is in the fourth quartile. All except one of the states in the far west region belong to the first quartile but nearly all the region's population belong to that quartile. Six of the northeast states are in the first quartile and six in the second and third quartiles, but 86 per cent of the population of the region belongs to the first quartile. The middle states and the northwest regions have ranks in the first three quartiles but with the middle states having more favorable ranks.

A closer analysis of the regional distribution of state ranks reveals the following phenomena. There is heterogeneity among the states in all the regions although more in some regions than in others. Within each region are distinct sub-regions where the variant health conditions are probably due to climatic, cultural, or population conditions. The ranking of the states tends to change slowly away from certain territorial centers such as in the case of Missouri in relation to the southern territorial center, and New Hampshire and Maine in relation to the northeast center. The variations in health ranking between contiguous states in the same region suggest heterogeneous distribution of the natural forces affecting health or the creation by some individual states of more effective health controls. Complete detailed explanations of the variations in health status within regions and between states would require detailed research into the underlying factors affecting the health of the population.

#### SPECIFIC HEALTH INDICES

While much credence must be given

to the ranking and regional distribution of the states in terms of the generalized health-sanitation index used in the previous paragraphs, it should be checked against some of the more specific indices. Among these, the infant death rate is probably the best single index of the health of a people. Preservation of infant life depends not only upon effective public medical and sanitary controls but upon the health intelligence of the family and the community. For this first index, the number of infant deaths plus stillbirths per 1,000 live births plus stillbirths was employed for the year 1940. For a second index of the level of health, the death rate from tuberculosis was used. The fight against that disease has been of sufficient duration and successful enough so that high death rates in any region are likely to be indicative of lags in medical and environmental controls. Unfavorable physical environment and selective migration may be important factors affecting the death rate from tuberculosis in some regions. Another mortality index is the combined deaths from the following infectious and contagious diseases: typhoid, paratyphoid, scarlet fever, whooping cough, diphtheria, and malaria. Other contagious diseases might be used but they occur sporadically due to epidemics in particular areas and for particular years, whereas those used in this index are more subject to control. A fourth mortality index is the number of deaths per 100,000 population in the age group of 1 to 60 years of age. This is used as an index of health because it shows the ability of communities to keep their members alive up to the end of that age period. The average duration of life in years for the United States in 1939-1941 was 63.62 years.<sup>2</sup> Consequently, the deaths before 60 years of age constitute a measure of a state's effectiveness in preserving life within its borders. Here again, migration of weaker population

stock and the inclusion of accidental deaths may reduce the reliability of this index.

The states were ranked according to their scores from these four indices, with the lowest mortality rate ranked as 1 and the highest as 48 (see Table 2). Individual states vary considerably in relative ranks on these four indices. However, there is much similarity in relative ranks; there are positive coefficients of correlation among these four mortality indices for the states ranging from  $+0.5$  to  $+0.9$ . The highest positive correlation is between infant mortality and death rate from infectious and contagious diseases.

The states may be classified as to their variations in ranks on these four mortality indices. First are 16 states which have nearly equal ranks, whether high or low, for all the indices; viz., Minnesota, Wisconsin, Indiana, Montana, Ohio, Missouri, Colorado, Virginia, Florida, Alabama, Mississippi, Louisiana, Arizona, Tennessee, Texas, and Georgia. These might be called the homogeneous states. A second class includes those states which have nearly equal ranks on two indices and nearly equal ranks on the other two but with considerable numerical difference in rank between the two pairs. Such are Connecticut, Nebraska, Kansas, Idaho, North Dakota, Vermont, Delaware, Maine, Kentucky, and North Carolina. A third group of states has three ranks nearly equal on three indices but with the fourth rank varying considerably from the other three. Such states include Oregon, South Dakota, Iowa, Wyoming, Rhode Island, New Hampshire, Oklahoma, New York, Maryland, West Virginia, South Carolina, and New Mexico.

In the case of the second and third groups of states, it is probably the existence of one or two variant causes such as population elements or health controls which account for the distribu-

tion of ranks. A last group of states consists of those with ranks varying for all four mortality indices. These states are: California, Washington, Utah, Illinois, New Jersey, Massachusetts, Michigan, Nevada, Pennsylvania, and Arkansas. They may be designated as the heterogeneous states and contain a variety of conditions which act as factors in the health of the respective state populations. Such health related factors are important in a regional analysis of the United States and will be given more attention in later pages. These data are only more proof of the heterogeneity of health conditions and health factors in a wide area such as the United States. Of course, that condition means plural health conditions but regional analysis will give a better overall picture.

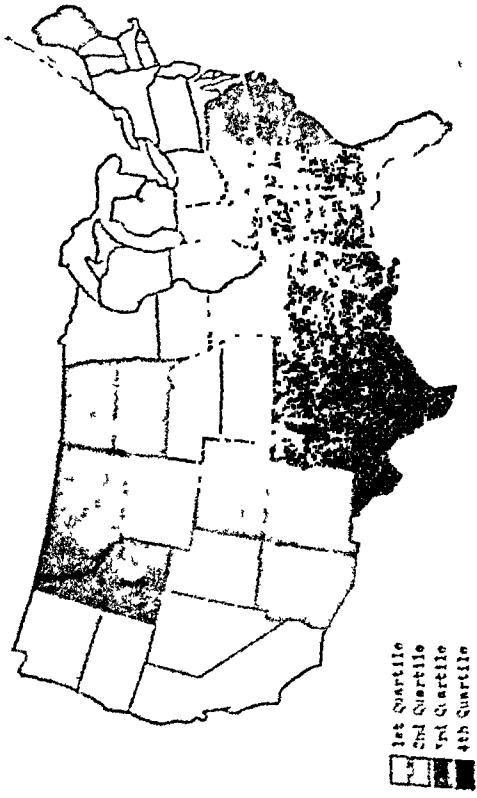
#### REGIONS OF THE UNITED STATES

Even a casual observation of the rates and ranks of Table 2 gives the impression that there are territorial patterns among the 48 states. Accordingly, in order to show the regional distribution, the states were grouped in quartiles according to rank and marked upon a map of the United States. Maps 2, 3, 4, and 5 showing indices of mortality are the result, and from them a picture of health regionalism may be obtained.

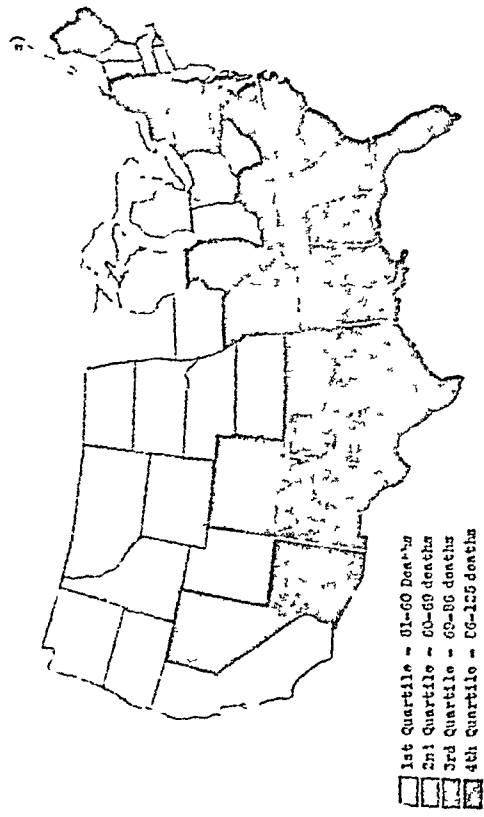
From Map 2 it is noticeable that all the southeast states except two are in the fourth quartile. All except one of the southwest states lie in the fourth quartile. On the other hand, all except one of the far west states are in the first quartile, i.e., those with low rates of infant mortality. The other three regions have mixed rankings among their states with adjacent states located in the central part of each region differing slightly in mortality rates but with wider differences in rates in the case of states located on the margins of regions.

Map 3 shows the regional distribution of tuberculosis mortality following a ter-

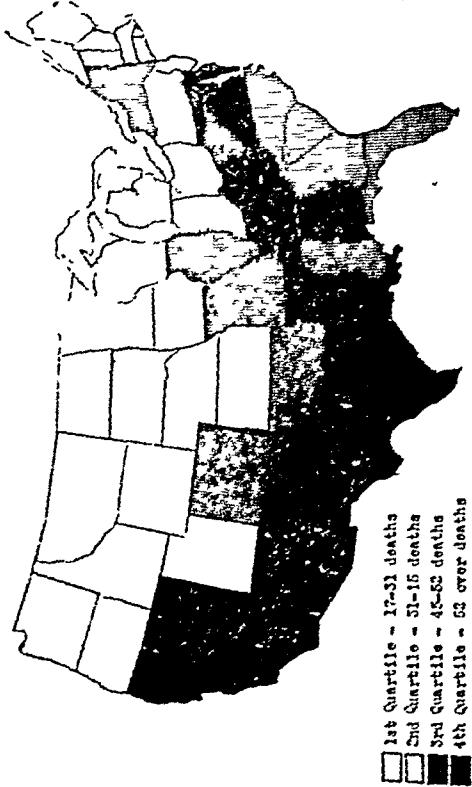
MAP 1—BIRTH-AND-DEATH RISK OF STATES—1940



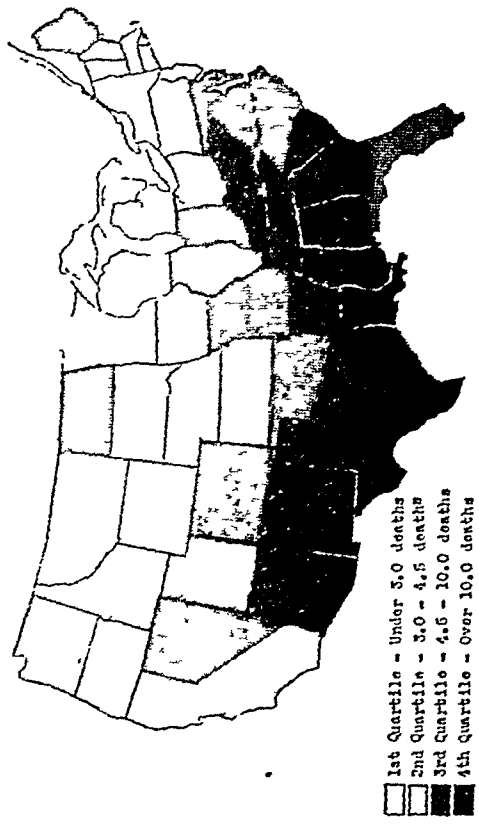
MAP 2—INFANT MORTALITY—1940  
(Infant Deaths plus Stillbirths per 1,000 Live Births plus Stillbirths)



MAP 3—DEATHS FROM TUBERCULOSIS PER 100,000 POPULATION—1940



MAP 4—DEATH RATE FROM SIX INFECTIOUS AND CONTAGIOUS DISEASES—1940  
(Deaths per 100,000 Population)



ritorial pattern quite similar to that of infant mortality. However, the southeast region has a somewhat lower ranking on this index, while the high mortality rate for tuberculosis in California is probably due to the migration into that state of tuberculars or potential tuberculars. The industrial states of Illinois and New York have higher rates than other states in their regions, probably due to effects of urban life or other local conditions.

The distribution of ranks for mortality from the selected infectious and contagious diseases is depicted on Map 4. The territorial pattern follows closely that for infant mortality except that the older industrial states have lower rates on this index. This is due to more complete medical care, sanitary facilities, and disease control in those states. Since climate is an important factor in this group of diseases, that cause must be kept in mind as explaining the ranks of some states.

The regional pattern of Map 5, which shows the quartile ranking of the states with respect to mortality in the age group 1 to 60 years of age, is similar to the other mortality index maps. The southeast region is largely in the fourth quartile of states while the southwest region has a better record but with individual states ranking in all four quartiles. The northwest region has a very favorable record with all except two states in the first quartile. This high status seems to be associated with a wholesome rural environment and a vigorous population stock. The far west region has state rankings chiefly in the third and fourth quartiles, probably due to migration into it of potential cases of mortality. Many of the industrial states as well as those advanced in culture and wealth have higher mortality rates in the age group 1 to 60 years than the rural and newer states. This is probably due to the occupational and daily hazards of industrial

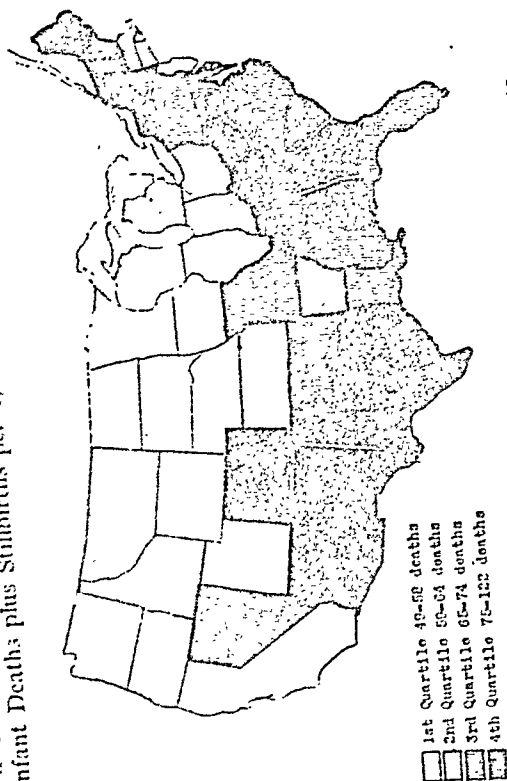
urban life and to migration into such states of persons who are higher mortality risks.

At this point a word should be interjected as to the use of statistics in such problems as have been treated in the preceding pages. There are numerous shortcomings in the application of statistical methods to human phenomena. In attempting comparisons between states, it is slightly misleading to apply ranks to states or to assign them to class-groups. Thus, differences in mortality rates may not be commensurate to the difference in ranks assigned them. The last state in one quartile may differ very slightly from the first state in the next quartile. All mortality indices are only approximate or partial measures of the health of a people since numerous adjustments must be made for population composition. Moreover, preventive and curative medical care may be lavished upon cases nearest death to the neglect of other segments of the population. Mortality statistics are still subject to error—due to incomplete registration and errors or variations in diagnosis of the causes of death. The health of a population is many-sided; some elements are all important while others are trivial. One disease may be much more damaging than another, and one type of malfunction may entail more physical and economic losses than another. Therefore health indices vary in their significance.

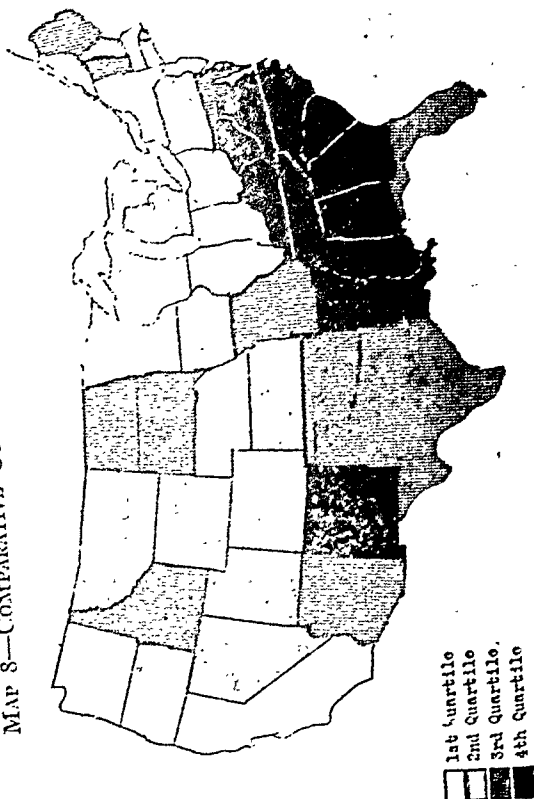
#### REGIONAL HEALTH FACTORS

As mentioned previously, the regional pattern of the states in terms of health-related factors and mortality indices is not one of perfect symmetry. Especially do we find cases of contiguous states varying considerably in rank. This gives rise to the hypothesis that numerous factors act in an accentuated degree to influence health conditions in certain individual states and areas. A brief

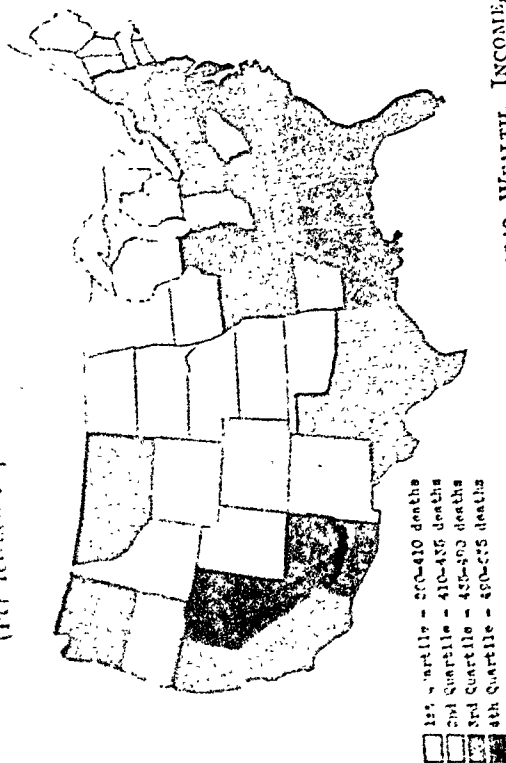
MAP 6—INFANT MORTALITY OF WHITE POPULATION OF STATES—1940  
(Infant Deaths plus Stillbirths per 1,000 Live Births plus Stillbirths)



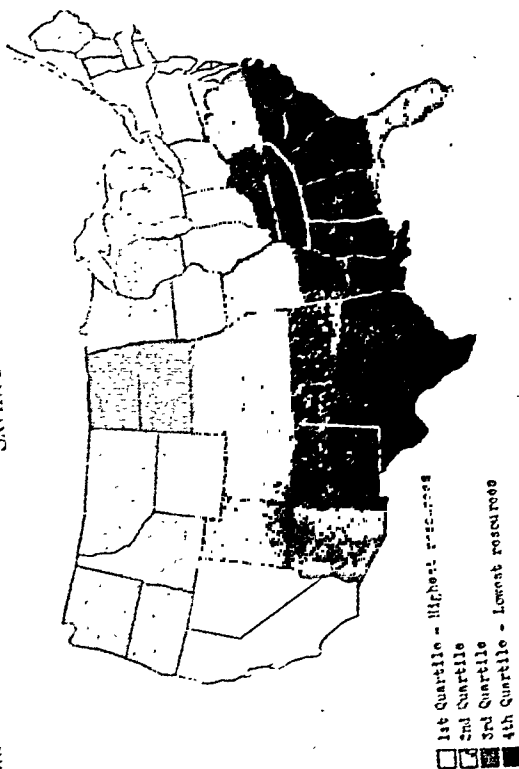
MAP 8—COMPARATIVE CULTURE OF THE STATES—1940



MAP 5—DEATH RATE IN AGE GROUP 1-60 YEARS—1940  
(Per 100,000 Population 1-60 Years of Age)



MAP 7—ECONOMIC RESOURCES OF STATES—1940 WEALTH, INCOME, SAVINGS



outline of such factors is given but with no attempt at complete analysis. Minute research is necessary to discover the operation of those factors in the regions and sub-regions of the United States.

*Climate*—There is much diversity of opinion as to climatic effects upon health. As a general rule, health, inclination to work, and social progress follow the same geographic distribution. Climate has direct effects upon the human organism as well as indirect influences through its effects upon the soil, the fauna and flora, occupations, and economic goods. These influences play their part in determining the health of various states and the relative rank of the regions of this country. Temperature and humidity may be conducive to specific diseases such as pneumonia or malaria as well as have indirect effects upon organic resistance. Warmer climates may promote the growth of insects, bacteria, and other parasites which are associated with infectious diseases. This seems to be the case of the southeast and southwest regions. However, a favorable climate may lower the health record of a state by attracting to its territory weaker population elements and those already afflicted with diseases. The states of California and Florida are examples.

*Population*—The processes of migration and selection may affect the health status of the various states. A common claim is that the westward migration in this country has given the central and western states a healthier population because of attracting the hardier elements to migrate to those territories. The health ranks of California and adjacent states have been influenced by the migration into their territories of tuberculars and invalids—those who migrate "for their health." Racial and nationality composition also may be associated with health rankings chiefly through economic and cultural status or because

of a lack of assimilation. A common conclusion is that the Mexican and Negro elements lower the health ranks of the southern and southwest states. By comparing the infant mortality ranks of the states as given in Table 2 for the entire population of each state with the ranks of the states for the white population alone, it is found that, of the 14 states having the highest percentages of non-white population, the ranks are lowered for 11 states and raised for 3 states when the rates for the white population alone are used—or a change of nearly five in average rank. Map 6 shows the regional distribution of infant mortality for the white population of the states. The most conspicuous change is the appearance of two north-eastern states in the last quartile. However, with some variations, the regional pattern of infant mortality ranks is much the same as on Map 2.

*Public Health and Medical Care*—In another study,<sup>3</sup> the coefficient of correlation between medical facilities and mortality rates was found to be significant ( $+0.6$ ), i.e., the more medical facilities, the lower the combined mortality from infant deaths, tuberculosis, infectious, and contagious diseases. However, there are many factors which account for the distribution of medical facilities over the United States. The per capita expenditure for public health by state governments does not have a significant correlation with the above mortality indices. There is no question about the value of public health programs, but it is difficult to find indices which will measure fully such values. The public health movement is so well developed that it stands so much to prevent what might happen and does not therefore show up in many comparative statistics. There is a worth while field for research into indices which will measure the effectiveness of public health controls. There is another interesting feature of the varying need for public health

TABLE 2  
Comparative Mortality Rates of the States—1940<sup>1</sup>

State	Infant Mortality <sup>2</sup>		Tuberculosis <sup>3</sup>		Infectious and Con- tagious Diseases <sup>3</sup>		Age Group 1-60 Years <sup>4</sup>		Average Rank of Indices Except Tuberculosis
	Rate	Rank	Rate	Rank	Rate	Rank	Rate	Rank	
Wash.	51	1	39.9	18	2.9	12	446	27	13
Conn.	53	2	36.2	16	0.8	1	410	13	5
Oregon	53	2	28.3	11	2.8	11	418	18	10
Minn.	54	4	26.7	10	2.0	5	327	2	4
S. Dak.	56	5	31.1	13	2.2	7	341	6	6
Calif.	58	6	56.2	39	3.4	18	488	36	20
Iowa	58	6	17.6	3	3.1	15	336	5	9
Nebr.	58	6	17.5	2	3.0	14	327	2	7
Utah	58	6	17.1	1	3.8	21	379	9	12
Wisc.	58	6	25.6	9	2.2	7	357	8	7
Ill.	59	11	47.3	30	3.6	19	491	37	22
N. J.	60	12	44.4	24	2.0	5	473	34	17
Kans.	61	13	25.0	8	3.8	21	348	7	14
Idaho	63	14	18.3	5	4.4	24	331	4	14
Mass.	63	14	37.1	17	1.4	2	421	20	12
Wyo.	63	14	17.9	4	3.2	16	409	12	14
Ind.	64	17	40.9	19	5.4	28	432	21	22
Mont.	64	17	41.3	21	3.9	23	443	26	22
R. I.	64	17	34.5	15	1.5	3	413	15	12
Mich.	65	20	34.1	14	2.5	10	414	16	15
N. H.	65	20	23.0	7	3.3	17	410	13	17
N. Dak.	66	22	19.5	6	5.5	30	280	1	18
Ohio	66	22	40.9	19	3.7	20	450	29	24
Vt.	68	24	43.4	23	2.2	7	388	11	14
Nev.	69	25	70.9	45	5.5	30	635	48	34
Del.	70	26	50.3	35	4.5	25	501	38	30
Pa.	71	27	42.9	22	2.9	12	464	31	23
Ark.	72	28	52.3	37	20.3	48	432	21	32
Okla.	73	29	49.1	32	9.5	35	384	10	25
Mo.	77	30	46.5	29	7.1	32	450	29	30
Maine	80	31	30.7	12	4.5	25	418	18	25
Tenn.	81	32	75.8	47	10.3	37	477	35	35
Colo.	82	33	44.5	25	5.3	27	435	24	28
Ky.	82	33	68.7	44	12.7	40	449	28	34
N. Y.	85	35	45.7	27	1.9	4	468	32	24
Md.	86	36	72.8	46	5.4	28	530	40	35
W. Va.	86	36	46.4	28	10.9	38	417	17	30
N. Car.	89	38	45.0	26	8.1	33	439	25	32
Va.	91	39	58.8	41	8.7	34	513	39	37
Fla.	92	40	51.1	36	9.7	36	597	46	41
Ala.	97	41	53.0	38	15.6	43	531	41	42
Texas	97	41	59.5	42	12.7	40	469	33	38
Mis.	93	43	50.0	33	19.0	47	537	42	44
La.	99	44	58.4	40	15.6	43	549	43	43
Ga.	101	45	50.0	33	11.8	39	563	44	43
Ariz.	103	46	142.9	48	15.2	42	573	45	44
S. Car.	110	47	48.0	31	15.8	45	606	47	46
N. Mex.	125	48	66.7	43	18.4	46	433	23	39

<sup>1</sup> Computed from *Vital Statistics of United States 1940*, U. S. Bureau of Census

<sup>2</sup> Infant deaths plus stillbirths per 1,000 live births plus stillbirths

<sup>3</sup> Resident deaths per 100,000 population

<sup>4</sup> Resident deaths per 100,000 population in age group 1 to 60 years of age

activities among the states. It seems that more complex cultures create perils to the health of their populations which, accordingly, will require additional defenses against the new dangers. For instance, data will show large cities with favorable health conditions. However, to maintain a high level of health, it

becomes necessary for the city to spend a sizeable portion of its economic product for protection against the health hazards created by urbanism. This may explain the high health ranks of some rural states where a vigorous population not highly congested and living in a wholesome natural environ-

ment does not need as many health and sanitary controls.

*Economic Resources*—There is a high positive correlation between economic resources and factors conducive to good health. Map 7 shows a decided regional distribution of economic resources—per capita wealth, income, and savings—with all except one of the southern states in the quartile of lowest economic resources. The urban industrial states have the most resources, with rural states much lower. Economic resources and health ranking follow each other quite closely with the exception of California and New York ranking relatively lower in health than in wealth and income, while the west north central states have better records in health than in economic resources.

Wealth and income are means to better health since they mean purchasing power to obtain wholesome commodities, medical services, medical and sanitary facilities, as well as to support public health activities. They are also influential in maintaining a wholesome diet—a factor of tremendous importance in the health of a people. But there are several limitations upon the apparent value of high wealth and income. How wealth is distributed within a population and how used are variable factors. High wealth and income create some conditions inimical to health, such as luxurious, idle living, urban congestion, and the strain of a highly mobile life. It is obvious that relative health needs, the price system and modes of rendering health services are factors in determining the values of economic resources in securing aids to better health for the population.

*Culture*—It is difficult to construct indices of the cultural level in its relations to health. Such an attempt was made<sup>4</sup> by using literacy, high school enrollment, school expenditure, governmental expenditures for recreation, and proportions of professional persons in

the labor force. Many others might be used but statistics by states are not available for all. Map 8 gives the regional pattern of the states in terms of the above index of culture, which follows closely that for economic resources but with exceptions in the case of several adjacent states. These variations show that cultural achievement is not entirely dependent upon economic strength.

The cultural level of a state is of importance in achieving and maintaining high health standards. Advanced culture in a people means an appreciation of the health factor in their lives; it means a demand for medical and sanitary services along with their intelligent use; it will emphasize the preventive aspects of health programs; it furnishes the capacity for the assimilation of public health education.

The close connections discovered to exist among health-related factors leads one to suggest that they constitute a definite culture complex in American society. The cluster of activities, programs, laws, traits, and institutions make up the health complex, within which there are patterns of interrelationships. These reciprocal influences as products of social evolution in this country should be considered in all health planning. Improvement in the health of the population will require action and reconstruction of those processes and institutions which are interrelated with existent health conditions. It is too long a story to enter into the details of this problem. Probably, the most outstanding conclusion from the correlations pointed out so far is the high degree of coincidence between favorable health status and the economic-cultural factors. This is to be suspected in the case of the United States. Briefly it means that, in order to obtain improvement in health, economic and cultural reorganization and reconstruction must be effected along some lines. It is necessary to recognize the economic



law that the greatest benefits of commodities tend to go to those parts of a country where culture is the highest and wealth is most abundant.

#### THE HEALTH REGION

The region is now a well accepted concept. In general terms it is thought of as a large area with natural boundaries wherein there are many resemblances among the inhabitants and their culture. Use of regional analysis has proved especially useful in a country like the United States with its diverse conditions and resources as well as because of the large number of its local and state governmental units.

"Health region" as a concept may also be used. Health regions are those major areas with distinct health conditions identifiable with the areal limits and caused by the natural and human factors operating within the natural boundaries. Such regions must stand out as distinct but are not completely different from each other. Moreover, their boundaries will shift with changes in the health-related factors.

There are many values to a regional measurement of health conditions.

1. It can define the situation, show the location of problems, the area, population, and extent of conditions.

2. It can reveal some of the causal factors. The ecological analysis can point out the rôle of climate, geography, pests, bacteria, and other enemies of health, the rôles of economic and social institutions with respect to communities and states.

3. It can create a civic consciousness toward health problems. A community or region may be made aware of its condition not only in relation to its own problems, but also in comparison with other regions. Such comparisons should not be condemnatory but only for the purpose of showing need for action.

4. It can point out definitely where conditions need improvement and enable medical planning to go immediately to the location of trouble. Programs for better medical care and public health measures can be adjusted to meet each concrete situation.

A survey of regions by health indices shows above all the variety and complexity of health conditions in the United States. Various sub-regions have their own special conditions and the problems of the nation cannot be described in one flat statement. Economic resources, cultural organization, and political divisions must be considered when planning health controls. To deal with regional health problems, it is necessary to inquire into the relations between man and his physical environment and into those phases of culture which function as controls upon the forces related to health.

There are different types of health regions. There is no standard classification of them since they may be grouped under either the actual health conditions or under the factors producing the conditions. Such a wide variety of types would include: climatic types such as sea-coast, plains areas, sub-tropical zones; regions characterized by particular diseases such as tuberculous areas, infant mortality regions, goiter belts, trachoma areas; population types such as Negro areas, Mexican areas, defective population zones, isolated regions; economic-culture types such as underprivileged regions; deficient medical care areas; regions with deficient sanitation. The mortality from heart disease, cancer, diabetes, and similar diseases varies by state and region. Detailed studies of such distribution will show that population composition, types of consumption, economic and cultural traits, and differences in disease diagnosis are the chief factors causing the regional variations. If states are identified with or belong to types of health regions, such regional analysis may be of value along several different lines. First, it may be pointed out how the health status is influenced or perpetuated by the environment and culture of a region. Second, such analysis locates health problems and may become

the basis for health programs, health districts, public health education, and administrative organization.

#### REGIONAL REORGANIZATION

Regional health surveys of the United States show some definite areas with subnormal health conditions which may be designated as underprivileged regions. Such are the southeast and southwest regions together with subregions in other parts of the country. How should these regional inequalities be dealt with? This is a pressing problem in the United States since equality of opportunity applies also to health. Although health indices show differentials in health conditions among the states over some period of time, there is no justification for the perpetuation of preventable deaths, disease, and disability in one region while vigorous infants and healthy adults live in another region. The American creed would not assume ill-health as a permanent characteristic of any region; rather it assumes the possibility of health control over environment and culture.

Since some regions must be aided to attain higher health levels, there are two main lines of attack: (1) by means of a shifting of financial resources from the more advantaged to the less advantaged regions, (2) by an economic and cultural reconstruction of the underprivileged regions. The first might be accomplished by public subsidies to states needing aid in health controls and services, by forms of nationalizing medical services and facilities with financial support from a national budget, or by foundations providing medical services and research where the local economy cannot support such. Economic and cultural reconstruction must seek such measures as readjustment of population composition, such as supply and human fertility differentials of the population, more effective and increased utilization of the region's resources, general educa-

tion of both juveniles and adults, and public health education. More specific measures would be agricultural adjustments, social-industrial improvements, reintegration of rural life into modern American culture, higher standards among racial elements of the population, redistribution of economic opportunities, and improvement of the folk culture.

All the suggestions for reorganizing regional health conditions constitute a large order. What limitations are there to such programs and how much is possible? To establish an equilibrium between population and resources is a long process since it must effect changes in the organic life of society. The whole problem is how to deal with human resources and natural resources in their relations to health problems. Both, for instance, are factors in providing medical services and facilities, the financial support coming from the economic-natural resources and human talents from the human resources. Effectiveness in reconstructing the internal factors of a region is limited by the time element; it takes time for processes to show results. Another shortcoming is man's ignorance of and skill in the technique of human reconstruction.

How far can or should resources be shifted into underprivileged health regions? Here again, there are limitations. It may be the age-old problem of taking from some to aid others; and elevation of one region at the expense of others can hardly be recommended as a permanent policy. Public opinion will determine the policies with respect to shifting of financial aid. It will be too much to expect that the same levels of health can be quickly established in all regions because many of the varying conditions over a diverse area like the United States are too fundamental to admit of quick change. How much action should be taken in aiding any underprivileged region by means of shifting financial aid depends upon: (1)

the relative importance of the health factor in human life, (2) the importance and efficiency of the particular measure for improvement of health conditions, (3) the obstacles to health progress such as climate, ignorance, etc., and (4) the extent to which there is an interdependent economy among the regions of the country, i.e., labor and enterprise of one region contribute to the wealth and income of another region. This would justify the financing of some of the social services by the economy of the country as a whole.

In dealing with the health of the public, an evaluation of means must be made. This study has shown that regionalism may be used as a technique by society for dealing with some problems where the forces are closely tied in with regional characteristics. Society, therefore, may sometimes use the regional approach in administration and control but at other times should not. There should be flexibility in the selection and use of social measures, controls, and institutions. Public health officials can employ the regional approach and seek to fit their programs to the problems and culture of the various regions. Consideration must be given to the pre-

vailing folkways and mores of a region. To be effective, public health education must utilize the characteristic modes of communication within a region, putting its message into the language and literature of the people.

Of course, the use of the region in health organization is limited because of the conflict between political and regional boundaries. Political units must be used very often but their programs must take into account the regional characteristics. In some cases, the health programs of the political units of a region may be synchronized through coöperative action. Physicians, specialists, hospitals, etc., might be distributed with special regard to the needs of regions and sub-regions; sanitary engineering must operate by regions in some cases and might in others; medical schools and medical research may serve regions by means of coöperation among states.

#### REFERENCES

1. Strow, Carl W. Comparative Health Factors Among the States. *American Sociological Review*, 11:42-52 (Feb.), 1946.
2. U. S. Bureau of Census, *U. S. Life Table and Actuarial Tables, 1939-1941*.
3. Strow, Carl W. Comparative Health Factors Among the States. *American Sociological Review*, 11:51 (Feb.), 1946.
4. *Ibid.*

---

## Lederle Renews Tick Fever Grant

Lederle Laboratories has renewed its grant of \$2,400 to the University of Colorado School of Medicine, Denver, for continuing research on Colorado tick fever. Under the direction of Dr. Lloyd J. Florio, Professor of Public

Health and Laboratory Diagnosis, studies will be continued to try to determine how the disease is spread, whether it exists in other areas and whether the virus can be isolated in nature.

# Municipal Public Health Engineering\*

Data on Current and Proposed Local Sanitation Divisions

## *Engineering Section*

A NEED exists in the field of public health engineering for the establishment of acceptable criteria on functions, cost, salary scales of engineers and sanitarians, and the quantitative relationship of such personnel to populations served and work performed. As a first step in this direction, the Committee on Engineering Administrative Practice of the Conference of Municipal Public Health Engineers has circulated questionnaires and compiled the resulting data. A summary of these data and comments thereon are being submitted as the report of the Engineering Section Committee on Municipal Public Health Engineering, the personnel of which is substantially the same as that of the Committee on Engineering Administrative practice.

The need for such information became acutely apparent upon the publication of the report, *Local Health Units for the Nation*, commonly spoken of as, "The Emerson report," in recognition of its author, Dr. Haven Emerson. This report, prepared without general engineering consultation or review, nevertheless, recognized the principle of engineering direction of all work in the public health control of the environment, and outlined the greater and more universal use of engineers in administering the environmental sanitation program of local health departments. The sharp reaction to the report by many engineers and sanitarians resulted from the fact

that the minimum sanitation program and personnel recommended in the report has been misinterpreted in some quarters as an authoritative proposal for an adequate program and budget, and as a consequence, has unfortunately and unintentionally, complicated the struggle of local engineering administrators in a number of places in achieving an adequate and balanced program in relation to community requirements and other departmental functions.

In general, few, if any, of existing local environmental sanitation divisions at the larger population levels are adequately organized or properly staffed. This is due to the fact that engineers, on whom effective local sanitation work depends, only recently have been employed in significant numbers. Eleven of the 17 bureaus of environmental sanitation represented by the data here presented have been organized since 1930. The few engineers engaged have had a herculean task in introducing a technical approach to the work and securing suitable personnel, or training old employees to become passable sanitarians. Rarely have circumstances existed where an experienced public health engineer could initially plan a theoretically desirable division and then bring it into being without major excisions and concessions to expediency—financial and political. Furthermore, should the engineer look around for some pattern of organization for such

a division, he would have difficulty in finding any data or literature expressing agreement of other engineers on the type of personnel required, the per capita cost of the program, or the population to be served per employee.

Early reports prepared by or in cooperation with the A.P.H.A. Committee on Administrative Practice, published in 1926<sup>1</sup> and 1932,<sup>2</sup> and of the American Child Health Association,<sup>3</sup> published in 1925, made only incidental reference to the employment of sanitary engineers in local health departments. The report of the Committee on Administrative Practice, published in 1939,<sup>4</sup> made a radical departure from preceding reports in recommending professionally qualified personnel for directing environmental sanitation programs and specifically recognized the possibility that sanitary engineers might serve in such positions. But even that report, published only seven years ago, recommended a salary range for such directors of only 75 per cent of the range suggested for nursing directors.

The report of the present Committee on Municipal Public Health Engineering is submitted, therefore, to focus thinking on these problems and to present some figures pointing the way to further study and conclusions.

A questionnaire dealing with current personnel figures, costs, and functions of their environmental sanitation divisions was circulated to a limited number of public health engineers. Seventeen responses were received. These engineers had an average public health experience of 15½ years, with an average time in present positions of 9 years. This gives some indication of the soundness of their judgment. An effort was made to establish a percentage relationship between the salary of the chief engineer and the health officer, and to determine what environmental sanitation control functions, if any, were not under engineering direction. The indi-

cations of functions being performed were not meaningful because of varying interpretations of the questionnaire and the limited number of responses. However, data on per capita costs of environmental sanitation programs and numbers of personnel in relation to the population covered were useful, particularly as tabulated from information submitted in a second questionnaire.

The second questionnaire asked for the engineer's concept of an adequate and satisfactory environmental sanitation division for population levels of 25,000, 50,000, 100,000, 250,000, 500,000, and 1,000,000. Three of the six forms used in the study were sent to each of fifty-four engineer-directors, each receiving the form corresponding to the current population of his health unit and, wherever possible, the forms for the two population groups next smaller. The theoretical units were considered as consisting of a city-county district with the city predominant in population. For each unit, the salary of the health officer was given in order that environmental sanitation salary ranges might be related to it. The health officer salaries were assumed to be respectively, \$4,000, \$5,000, \$6,000, \$7,500, \$8,500, and \$10,000, for the population units mentioned above.

Those receiving the questionnaire were requested to state their concept of an adequate division of environmental sanitation conforming to the best current practice, related to their present geographical locations, and disregarding the one dollar per capita overall cost limitation. Laboratory and labor costs, if reported, were excluded from the totals in compiling the data. In determining the total salary cost, the median of the salary range of each position was used.

Seventy-four responses were made by 34 engineers or division heads. These were tabulated by population levels and

further grouped as to geographical region, i.e., South, North Central, West and East. As in all such data, there were extremes and abnormalities in some of the reports which unduly influenced the averages. However, in the summation of the averages, there was a surprisingly smooth pattern of curves and consistency in the figures on per capita costs and population per employee.

From Table 1, "Summary of Data" the sequence of positions and salary ranges, as derived from the individual responses, will be apparent. It was painfully obvious, from some of the proposals, that several engineers do not appreciate their importance in the public health field or their relative value in terms of salary. A very few responses indicated that the engineer considered himself worth only half the health officer's pay. Assuming that the engineer is capable and effective in his job and that a rational professional relationship exists between the engineer-director and the health officer, the engineer's pay should be governed by the fact that he administers work lying outside the physician's field of professional competence. The engineering profession is parallel and not subordinate to the medical, and the engineer-director should ordinarily command the second highest salary in the department, there being no quarrel with the medical executive tradition.

From the summary of data, it will be seen that the averages of minimum and maximum engineer salaries ranged from 65 per cent to 80 per cent of the average of the health officers' salaries, the latter being intended to represent a fixed maximum. These are significant figures and deserve to be kept in mind. In the seventeen cities and districts reporting, where the environmental sanitation directors are old employees and presumably at their maximum salary range, their pay averages 62 per cent of

the health officers' salaries. Ten of these seventeen departments have budgets exceeding \$1 per capita. Until engineers themselves generally evaluate their services at their true professional and social worth, they cannot expect fair relative compensation. Furthermore, a depressed salary for the engineer means reduced scales of pay for all subordinates, and consequent difficulty in attracting and retaining competent sanitarians and technicians.

Of major interest are the figures on estimated per capita costs of the environmental sanitation program. There is surprising uniformity for all population levels. The average of 33 cents per capita is another significant item. With \$1 per capita ceiling, largely self-imposed by public health authorities, and with approximately 50 per cent of the local budget allotted to nursing services, it is obvious that the budget must be increased or sanitation and other services will suffer. Needless to say, sanitation expenditures which equal 33 cents are a rare exception other than in the South where labor costs of mosquito and rodent control are included. Among four cities with populations ranging from 208,000 to 300,000, that reported actual costs, two in the South spent over 50 per cent of their budgets on environmental sanitation, thus accounting for the 33.2 cents per capita for this group.

Engineering administrators should think in terms of the overall cost of sanitation and so be in a position to advocate a general health budget with a definite and adequate share for environmental sanitation.

Closely related to per capita cost is the population load per environmental sanitation program employee. While the reports recommend on the average 1 environmental sanitation employee per 13,530 population, regional differences are apparent in the basic data. Population loads in the South generally averaged 11,700 as contrasted to 16,700 in

TABLE 1  
Summary of Data from 74 Questionnaires on Proposed Sanitation Divisions, State Departments of Health

Population of Districts	Personnel and Average Salary Ranges												Average Population per Employee							
	Assistant Engineers						Sanitarians			Veterinarians				Average Budget						
	Grade 1		Grade 2		Grade 1		Grade 2		Grade 3		Total Salaries	Travel		Per capita						
	Num-ber	Salary Range	Num-ber	Salary Range	Num-ber	Salary Range	Num-ber	Salary Range	Num-ber	Salary Range										
25,000	9	7	\$3,140-3,910	..	....	..	....	7	\$2,010-2,860	3	\$1,600-2,200	..	....	..	....	\$8,280	\$1,560	\$0.331	12,440	
50,000	17	15	3,190-4,130	6	2,750-3,410	..	....	20	2,560-3,350	18	2,030-2,900	..	....	..	....	15,070	11,500	2,530	0.318	14,890
100,000	20	20	3,965-4,990	13	3,180-3,890	..	....	54	2,710-3,500	67	2,215-2,830	7	1,650-2,325	9	3,010-3,820	32,860	24,650	4,690	0.329	13,500
250,000	18	18	4,350-5,650	18	3,975-4,950	16	3,530-4,440	77	2,950-3,650	219	2,310-2,910	15	1,540-2,560	12	3,390-4,210	91,730	72,840	10,990	0.366	12,900
500,000	6	6	5,730-7,050	13	4,510-5,420	22	3,950-4,550	18	3,580-4,190	49	2,680-3,190	106	2,250-2,990	16	3,700-4,770	155,660	121,880	16,170	0.311	14,360
1,000,000	1	4	5,020-7,020	14	4,370-5,620	2	3,951-5,100	30	3,350-4,220	220	2,520-3,350	25	2,400-3,000	8	3,570-4,600	318,340	255,540	21,860	0.318	13,100

a. A Grade 3 was also recommended for these communities; a total of 4 engineers with a salary range between \$3,000 and \$3,600  
b. Engineer-Directors' salaries' average 65 to 80 per cent of Health Officers' salaries

TABLE 2

Percentage Relation of Salary of Engineer Director of Environmental Sanitation to Health Officer's Salary, 17 Municipal Health Departments

Population	Number of Departments	Engineer's Salary as a Percentage of Health Officer's Salary	Sanitation Division	
			Per Capita Expenditures	Population per Employee
90,000- 100,000	3	62	\$0.510 <sup>a</sup>	12,000
208,000- 300,000	4	61	0.332	11,500
456,225- 492,370	2	65	0.154	21,000
816,000-7,700,000	6	62	0.194	19,500

a. Includes one Southern City with 40 per cent of a \$3 per capita budget for sanitation.

the North Central area. This may be compared to the Emerson report minimum proposals wherein environmental sanitation program loads varied from 21,000 to 36,000, without any geographical distinctions.

Such figures on population load are much less valuable and applicable in the field of environmental sanitation than in the medical and nursing activities where the individual is the basic unit. In an environmental sanitation program, many factors such as climate, geography, industry, density of population, and political structure affect the functions and work load. These factors are complex and extremely variable, so that no precise pattern may ever be prescribed which will have general application. However, with further study, a basic population load might be established with modifying coefficients which would be useful as a guide.

The question of work load, in terms of population served per employee and with reference to routine activities, has received attention on the part of several groups but has been neglected by those most concerned, the engineering administrators. The U.S.P.H.S. Division of Public Health Methods, reporting in *Public Health Reports* of June 14, 1946, on the findings of a study of 933 full-time local health departments, gives the median ratio of population per nurse position as 10,800; and the ratio per sanitation position as 24,800. In subsequent discussion this report refers to

the Emerson recommendations and points to a 50 per cent deficiency in nursing personnel and an overall adequacy of sanitation positions. It is difficult to follow such reasoning, except in view of the commendable job performed by the nursing profession in urging small population work loads. Former reports of the Committee on Administrative Practice (previously cited), in recommendations not limited by the \$1 ceiling, suggest sanitation budgets of 20-25 cents per capita, and list desirable activities to include: city planning, supervision of water supplies and sewage disposal, housing, sanitation of public buildings, industrial establishments, swimming pools, beaches, barber shops, fly, mosquito and rodent control, supervision of school sanitation, food and milk control, but exclude plumbing, cross-connections, and private sewage disposal, and provide for meat inspection costs to be supported by fees.

These reports, and they are not very old, would seem to favor a reduced emphasis on the environmental sanitation program as related to other activities on the basis that general nuisance control has been a wasteful and unjustifiable activity. This is a consequence of little or no recognition being accorded the newer technical and epidemiologically sound activities that have been confronting environmental sanitation personnel in recent years, just as in public health nursing the routine placarding of



all communicable diseases has been supplanted by other activities.

Other factors of major importance that need further study are: personnel organization and supervision, competence of the individual employees, specialized versus generalized field work, etc. An urgent need exists for detailed and widespread time studies, under engineering direction, of the field work of the sanitarians for every routine function. Methods and formulae for the evaluation of environmental sanitation activities and programs are similarly needed. Only information of this character will enable engineering administrators to arrive at sound conclusions as to personnel requirements.

The several groups of engineers now exploring the factors of and personnel requirements in an environmental sanitation program should push forward their work and should enlist the aid of every official and public health agency in a position to assist in the detailed studies. Engineers in the public health field should feel keenly their professional responsibility in furthering such efforts and in clarifying and defining their part in the public health program so that their findings may be authoritative and widely accepted.

#### SUMMARY

1. Acceptable criteria need to be established by public health engineers for local environmental sanitation divisions as to personnel requirements, salary ranges, costs, and work loads.

2. Data are presented as secured and compiled by the Committee on Engineering Administrative Practice of the Conference of Municipal Public Health Engineers, such data

consisting of responses to two questionnaires, one on *existing* local environmental sanitation divisions and the other on *proposed fully effective* divisions for population units of 25,000, 50,000, 100,000, 250,000, 500,000, and 1,000,000.

3. In the proposed sanitation divisions, engineer-director salaries ranged from 65 to 80 per cent of the corresponding health officers' salaries, whereas in established departments, engineers' salaries, after long employment, averaged only 62 per cent.

4. Per capita costs for environmental sanitation programs averaged 33 cents in the proposed divisions, with higher costs in the South and lesser costs in the East and the North Central areas.

5. Population loads per employee in the proposed divisions averaged 13,530, with a range from south to north of 11,700 to 16,700, respectively, as compared to population loads of 21,000 to 36,000 in the Emerson report, where no geographical distinctions were made.

6. Engineers are urged to proceed promptly to the development of criteria which can be accepted and used as the basis for further development of local public health engineering work.

#### REFERENCES

1. Municipal Health Department Practice for the Year 1923. *Pub. Health Bull.*, 164, July, 1926.
2. Hiscock, Ira V. *Community Health Organization* (2nd ed.). New York: The Commonwealth Fund, 1932.
3. Research Division of Child Health Association. *A Health Survey of 86 Cities*. New York: American Child Health Association, 1925.
4. Hiscock, Ira V. *Community Health Organization* (3rd ed.). New York: The Commonwealth Fund, 1939.

LEONARD M. BOARD, *Chairman*  
J. LLOYD BARRON, C.E.  
WILLIAM H. CARY, JR., C.E.  
JOEL I. CONNOLLY  
WILLIAM J. DIXON  
ALFRED H. FLETCHER  
MORTON S. HILBERT  
F. GARDNER LEGG  
SOL PINCUS, C.E.

# Newspapers—Public Health Allies

PAUL F. ELLIS \*

*United Press Science Writer*

WHEN President Truman made the historic and fateful announcement that America had built an atomic bomb and had dropped it on the Japanese city of Hiroshima on August 6, 1945, most Americans did not realize that they were being snapped out of a deep sleep.

The start of the atomic age found the average American—and for that matter the average citizen in any country—with a sleepy knowledge of the part that science really had in his health, his happiness, his fate.

Mankind for centuries has sought health; what to do to make this short life on earth as happy as can be and prolong it as much as possible. But in all the years Mr. Average Man left such problems to those with whom he believed he had no common language. When the atomic bomb dropped on Hiroshima demonstrating in an awesome way just how human fate is wrapped up in science, there came a new awakening.

The people of this country really became interested in science, not alone interested in the science of making atomic bombs. Mr. Average Man wants to know why, if science can make a bomb that will destroy tens of thousands of lives in seconds, science cannot save lives, make people happy through health, and prolong both health and life.

There are many thousands of Americans today who believe that if science can spend two billion dollars to build an atomic bomb, then why in goodness name can't a cure for cancer be bought for a similar sum, or less. This is mentioned as an example of the consciousness of the American toward the part he believes that science—and here we are approaching medical science—can play in his welfare.

It cannot be denied—it should be emphasized—that the average American today is more interested in his health than ever before. The American today will go more than half way with health officials if he is given the chance.

The American Public Health Association is one of the nation's oldest and most respected organizations that have helped to keep this cosmopolitan nation the greatest in the world. With its own cosmopolitan membership, it is an organization that springs from and represents the grass roots of America.

The organization's great work is recognized by the profession—those who are "in the know." The time has now come, however, when this Association can dramatize the renewed interest in science created by the war to get its health message to every corner of the country. Not only must it realize the importance of public education, as it does in common with many other professional organizations, but it must make the climate in which this education can be widespread and result in effective action. As an example, the average American today is more conscious of the problems and the coöperation needed to control cancer than ever

\* Mr. Ellis is the Science Writer of the United Press. In this capacity he attended the 74th annual meeting of the Association in Cleveland. He and other press representatives who were present at that meeting regretted what they regarded as an indifferent attitude of the program speakers toward reaching the public. He was invited to bring his impressions and those of his newspaper colleagues to the first meeting of the 1947 Program Committee in the hope that the speakers on the coming Atlantic City program could be induced to accept greater responsibility for sharing their information with a wide public.

before. This has been the result of much-too-recent campaigns to educate the public on cancer.

Another example is the National Tuberculosis Association. Statistics show that while tuberculosis still is a menace to American health, this disease is being brought under control, due in great part to public education.

Still another example is the National Foundation for Infantile Paralysis. While some progress has been made toward controlling this disease, the Foundation undoubtedly will do even a greater job in public education and ultimately win a great victory. Within the last year the Foundation assisted this writer in visiting many of the nation's top laboratories, which it is helping financially, and to have a free hand in reporting for the United Press just what is being done on polio. The response to this series of stories published in the lay press was outstanding. It was an example of how medical science can cooperate with the lay press to meet the cooperation from the lay public in a natural, but latent, desire for knowledge.

The American Public Health Association with its many affiliated organizations can be made a great information center for the American public, particularly on the science of preventive medicine. This Association with its long standing as a recognized major force in public health, could come out now with literally both fists swinging to knock down the barrier separating the average man and those who have the responsibility of keeping this nation healthy. The Association could make its annual meeting a major scientific news story of the year. The participants in the discussions could slant their reports and papers toward the minds of 140,000,000 Americans--and not exclusively to the circle of learned men and women in the profession. This means foregoing ten dollar words and sixty-four dollar ques-

tions. It means making papers or abstracts—that really abstract the highlights—available to the press in time to be presented to the public, accurately and effectively.

The Association could help the "recalcitrants" to see the light that the average man wants to guide him toward cooperation with public health authorities in the quest for a life that will continue its natural course free from disease.

There is no better example of this desire to cooperate on the part of the public than during the smallpox scare in New York City last spring. Some 2,000,000 persons submitted themselves for vaccination. They had been properly educated. The health officials had talked their language. What might have been a serious epidemic was averted.

The science writer of the press services and the newspapers is very close to Mr. Average Man—in fact, is one. He realizes his responsibility in reporting accurately the news of medicine. The conscientious science writer does not seek to sensationalize. He seeks to be a good reporter; to tell his story in words that Mr. Average Man understands.

The cooperation between science writer and scientist is growing all the time. Many scientific organizations now realize the value of the lay press, particularly the science writer, in carrying their messages to the public. Without this support scientists could not exist in this fast moving scientific age.

The American people deserve to know what the members of this Association have found about the best methods of organizing their local health departments, the most effective methods of finding, curing, and preventing communicable diseases, the best handling of sewage and other wastes, the best organization of a child health program. They demand such education. The American Public Health Association can, if its members so will, play a great part in this new education for a new age.

# American Journal of Public Health and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 37

July, 1947

Number 7

## Editorial Board

REGINALD M. ATWATER, M.D.  
*Chairman and Managing Editor*

LEONA BAUMGARTNER, M.D.  
MARTIN FROBISHER, JR., D.Sc.  
PROFESSOR JOHN M. HENDERSON

RALPH S. MUCKENFUSS, M.D.  
STUART MUDD, M.D.  
RAYMOND S. PATTERSON, Ph.D.

C.-E. A. WINSLOW, Dr.P.H.

C.-E. A. WINSLOW, Dr.P.H., *Editor*

AUGUSTA JAY, *Editorial Associate*

## TWO NINTHS

THE 9th Edition (1946) of *Standard Methods for the Examination of Water and Sewage*—already in print—and the 9th Edition of *Standard Methods for the Examination of Dairy Products*—shortly forthcoming, with a 1947 date line—are links in a long chain of publications, the texts of which are perhaps as well known to many readers of the *Journal* as are familiar passages of Holy Writ. These volumes are essential elements of the very life blood of the American Public Health Association. Its standing Committee on Research and Standards, its Coordinating Committee on Standard Methods, and the devoted committee members concerned have given unstintedly of themselves to the task of making each of these books the best in its series over a long period of years and the outstanding publication in its field anywhere in the world. The unusual merits of each of these "Ninths" will be fully realized only by those whose activities require frequent use of one or both of them. Although both books have been prepared under the stress of war, never before has so much consultation, deliberation, and review gone into an edition of either the "Water" or the "Milk" report, with the result that both volumes should better represent than do any previous editions the opinions of the members of the Association as a whole. Since, in their preparation, both manuscripts benefited from extensive collaboration with other national and international associations through appropriate committees, the volumes epitomize the viewpoints held by experts in these fields of endeavor throughout the territory the Association serves.

The 9th Edition of *Standard Methods for the Examination of Water and Sewage* has been prepared, approved, and published jointly by the American Public Health Association and the American Water Works Association, with active participation by committees of the Federation of Sewage Works Associations and the American Chemical Society. Great credit goes to Dr. John F. Norton who as chairman of the Joint Editorial Committee carried the torch that directed the way to accomplishment.

The style of the new edition of the water and sewage report has been different from that of preceding editions; many persons who have seen the publication consider the layout an improvement over the make-up of earlier editions as it

a few have expressed regret that a change in format was made. The bibliographies have been revised, so that articles on which a method is based are listed in chronological order at the end of each section. The index has been revised and enlarged. The book is divided into four parts with two appendices.

Part I includes physical and chemical methods for water analysis. These methods have been arranged independently of the type of water to be analyzed. In the previous edition, an attempt was made to classify the chemical methods for water according to the class of water to be tested. For example, methods for boiler water analysis were given in a separate section. In the 9th Edition, all methods for chemical analysis of water (with the exception of the non-standard methods which still remain in Appendix I) have been consolidated into Part I so that the analyst will find the particular procedure he requires under the appropriate constituent for which the assay is to be made. While this change has been hailed as an improvement by most experienced analysts who are accustomed to the use of Standard Methods procedures it is proving a little confusing to some persons who consult the book only occasionally. The methods for examination of water show many changes and revisions. For example, the test for oxygen consumed has been omitted. The procedures for odor have been completely revised and additional methods have been added for dissolved oxygen, to eliminate interference by other materials. The methods for residual chlorine have been revised in accordance with the recommendations of the Committee on Control of Chlorination of the American Water Works Association. Many new procedures for the detection of various ions have been added, including technics for chromium, phosphates, and fluorine.

In Part II—covering the examination of sewage and sewage effluents—the procedure for dissolved oxygen has been completely modified and the residual chlorine method has been revised to conform with the technique for water. A new diluting water is recommended for the biochemical oxygen demand test. There are several other changes in, and additions to, the various methods.

The text of Part III—relating to the microscopic examination of water, sewage sludge, and bottom sediments—has been revised and expanded to include a more detailed description of the calibration of the microscope and to provide for the reporting of results in standard units.

In Part IV—the section covering the bacteriological examination of water—tryptone-glucose agar has been added as a plating medium, as has lauryl-sulfate-tryptone broth for the coliform test. Fuchsin broth and formate ricinoleate broth have been deleted as media for the confirmed test, although the latter is recommended for special purposes, when spore-forming organisms are found in the completed test. The schematic outlines have been revised, as has the section on coliform density. Bacteriological examination of water from swimming pools is included as a standard, instead of a provisional method. The Eijkman test has been added to the section on differentiation of coliform types.

This section on bacteriological examination of water continues much the same as in previous editions. The group responsible for the present standard procedures have not proceeded blindly upon the assumption that our traditional approach to the bacteriological examination of water should be continued at any cost; but coliform group as an index for judging the effectiveness and the continuity of treatment or the quality of the water as delivered to the consumer. This edition,

however, reflects an open-minded attitude toward continued research and investigation by including once more the scheme for differentiation of coliforms and by incorporating the British methods in an appendix.

Some of the procedures formerly included in Appendix I of the 8th Edition have been transferred to Part I of the 9th as standard procedures. Among these are methods for chloride in low and high chloride waters, for chlorine and for chlorine demand. A few procedures have been deleted from, and a few added to the appendix. Appendix I includes 12 pages of interesting information regarding British practice in the bacteriological examination of water. Extracts from the revised edition of "Bacteriological Examination of Water Supplies," published as Report No. 71,<sup>1</sup> in the British Ministry of Health Series, enhance the value of the 9th Edition and broaden its scope. Appendix II contains a new list of reagent grade chemicals approved by the American Chemical Society, and a new section in which directions are found for preparing the more common laboratory reagents used in water and sewage analysis.

The forthcoming 9th Edition of *Standard Methods for the Examination of Dairy Products* has been prepared jointly by the American Public Health Association and the Association of Official Agricultural Chemists, with assistance from individuals and committees in such organizations as the International Association of Milk Sanitarians and the Dairy Science Association. As has been true of several previous editions, the guiding genius who carried the work to completion, this time under unusual difficulties, was Dr. Robert S. Breed in the capacity, first, of chairman of the Standard Methods Committee on Milk and Dairy Products and, later, as chairman of the Joint Editorial Committee. To his resourcefulness, untiring enthusiasm, and broad knowledge of the whole dairy industry and of the authorities in diversified related fields, the Association is indebted for an edition that far surpasses all of its predecessors. When Dr. Breed would no longer carry on in a dual capacity, Dr. A. H. Robertson was selected for the chairmanship of the committee. Dr. Robertson has brought to this edition an entirely new approach in the presentation of the material and, particularly, a use of the imperative style in the directions to be followed that has eliminated much of the ambiguity of style present in earlier editions. The technician will no longer become bewildered with superfluous discussion and comment when following a scheme of analysis. In the interest of uniformity of arrangement and style in the 9th Edition, the reports by the various referees have been extensively edited to conform to the imperative style of presentation which has been mentioned. The introduction of a simple system of cross-references, and a more satisfactory method of indexing, add greatly to the usefulness of the book. Much duplication and many ambiguities which appeared in the texts of earlier editions have been eliminated in this complete rewriting of the text. Directions clearly reveal whether or not a procedure, or a step in a procedure, is mandatory or optional.

In the 9th Edition of *Standard Methods for the Examination of Dairy Products*, suggestions useful to administrators will be systematically assembled in the first chapter on "Selection and Interpretation of Quality Tests." Credit goes to Luther A. Black for developing this valuable chapter, which briefly describes each test and explains its applications and the limitations of the analyses when the test is used to examine: (1) raw milk and cream intended for pasteurization, (2) pasteurized milk and cream, (3) raw milk and cream to be consumed raw, (4) butter, (5) cheese, (6), frozen dessert ingredients, and (7) frozen desserts. This chapter will enhance the usefulness of the volume to health officers, sanitarians,

operation indicated (26 such operations had been advised on the initial examination and 14 performed; but there was no evidence that these 14 were in better health than the 12 who had not followed this advice). All in all, the children, as a group, were in excellent physical condition; and it would appear that the initial health examination on entrance followed up by annual nurse-teacher conferences, was a definitely satisfactory procedure. If, to the number of children whose defects were brought under care, as a result of the initial examination (47), we add the 3 discovered outside the school, we have a score of 69 per cent on the basis of 50 out of 77 defects corrected. If the initial 1940 examination had been as complete as the 1946 recheck, this figure could have risen to 95 per cent. It would seem clear that a really complete examination at entrance, followed by continuing nurse-teacher supervision, may be an extremely effective procedure.

It should be pointed out that these results were obtained in a population of relatively low economic status but with excellent public medical facilities.

A particularly revealing result of the 1946 study was the very high prevalence of emotional problems of various sorts—in sharp contrast with the favorable findings with respect to physical defects. Disturbing factors in home environment and emotional life were discovered in 44 of the 114 children (39 per cent); and in 10 of these children, the problem was of serious gravity. This is a point on which we lack any general norms of comparison, but it seems clear that this problem requires earnest and constructive consideration. It is probable that in most schools lack of emotional adjustment is quite as important as physical defects and diseases. When more schools follow the example of Astoria, the inadequacy of our community mental hygiene facilities will be revealed in shocking proportions; but we shall only obtain such facilities when the need for them is demonstrated.

The Astoria study is also of great value in demonstrating the intimate relationship of the doctor, the nurse, the teacher, and the parent in a school health program which is really to function. Dr. Yankauer says, on this point "Recent trends of thought in the field of school health have emphasized the fallibility of shaping school medical services solely to prevent and correct physical defects. The importance of educating parent and child to seek early medical assistance, of promoting a positive attitude toward the maintenance of health, and of dispelling inherent fears of doctors and disease by making the examination a desirable educational experience, has been stressed. The presence of the parent and the provision of adequate physician time are essential if this is to be accomplished in the elementary school." We wish he had discussed the influence of the Astoria program on the understanding by the teacher of the health problems of the child in a broad sense. We suspect that coöperation of the sort provided here must go far toward vitalizing and individualizing all classroom instruction.

Finally, this study is of particular significance as illustrating the sort of intensive investigation which is necessary to make the school health program everywhere a really effective instrument of health promotion. Other programs may be as good as the Astoria plan or better. If so, let us have similar careful analysis of the actual health status of the children after exposure to each local program. If a score of health departments would initiate studies of this type, we should really know where we go from here.

#### REFERENCES

1. *What Is the School Health Program?* - Editorial *A J P H.*, 34:1097 (Oct.), 1944.
2. *The Test of Effectiveness* - Editorial *A J P H.*, 35:1222 (Nov.), 1945.

3. Yankauer, A. An Evaluation of the Effectiveness of the Astoria Plan for Medical Service in Two New York City Elementary Schools. *A.J.P.H.*, this issue, p. 853.
4. Nyswander, D. N. *Solving School Health Problems*. New York: Commonwealth Fund, 1942.

## NUTRITION AND VITAL RESISTANCE

IT is always exciting when two separate fields of scientific research reveal a point of common contact, so that light from two directions may converge on a single problem.

Such an illuminating convergence was effected in a paper presented by Ames and Nungester<sup>1</sup> at the spring meeting of the Society of American Bacteriologists. These observers worked with the exudative polymorphonuclear leucocytes of guinea pigs and observed their phagocytic activity and their physical stability (in presence of serum) with the addition of varying amounts of ascorbic acid. With concentrations of ascorbic acid of 0.25 mg. per 100 ml. of exudate, only 30 to 35 per cent of the cells showed phagocytosis; with one 1.0 mg. per 100 ml., 80 to 90 per cent of the cells were active. Serum in the system not only promotes phagocytic action, but also protects the phagocytic cells from rupture and destruction. With the low concentration of ascorbic acid, 15 per cent of serum is necessary to obtain this protective action; with the high concentration of ascorbic acid, 5 per cent of serum will do the trick. In the absence of protective serum, 90 to 95 per cent of the cells were ruptured with the low concentration of ascorbic acid; while only 5 to 10 per cent of them were destroyed in the presence of the high concentration.

There is nothing new in the general concept that good nutrition promotes vital resistance. At the same meeting of the S.A.B., Dubos and Pierce reported the marked influence of diet on the susceptibility of mice to experimental tuberculosis infection.<sup>2</sup> What is new in the studies from Nungester's laboratory at Ann Arbor is the identification of two specific physiological reactions to a specific vitamin. When laboratory techniques, such as these, are devised which will yield precise quantitative results, the investigator is provided with an instrument of research far more powerful than mere clinical observation or even than the procedures of experimental epidemiology.

### REFERENCES

1. Ames, A. M., and Nungester, W. J. The Relationship Between Ascorbic Acid and Phagocytic Activity. *Abstracts of Proceedings for the 47th General Meeting of the Society of American Bacteriologists*, 1947, p. 53.
2. Dubos, R. J., and Pierce, C. The Effect of Diet on the Susceptibility of Mice to Experimental Infection with *Mycobacteria Tuberculosis* Bacilli. *Abstracts of Proceedings of the 47th General Meeting of the Society of American Bacteriologists*, 1947, p. 66.



City Health Department. We have tried to meet the increased cost of living by making an approximate 10 per cent increase in salaries during the past year for all staff positions except division heads. Then again we have increased the vacation period with pay this year from two to three weeks for all employees. Now we are proposing to go on a 40 hour, 5 day work week. This will give employees an opportunity to add to their present salaries by securing additional employment elsewhere over week ends. Nurses can make \$10 for 8 hour duty in our local hospitals, and some of our nurses are already doing this on Saturdays and Sundays.

"In spite of all that we have done, we are losing personnel because of what they consider as inadequate salaries. There is dissatisfaction on the part of many who are still with us. Our present salary range for public health nurses is from \$145 to \$210 per month, the lower salary being paid to beginning nurses with no public health experience or training. However, nurses just out of hospital training are offered \$200 per month for a 40 hour week in one of our local hospitals. We cannot compete with that. One can easily appreciate how a nurse who is paid \$150 per month in this department would find it difficult to make ends meet after having a salary deduction made for income tax plus a 3.5 per cent deduction as a contribution toward the Municipal Retirement Fund. After paying \$10 per week for a room (apartments run much higher), and considering the high cost of food and clothes, there is not much left for insurance, recreation, etc. Certainly a nurse could not buy a car at present prices with such a salary. In fact, we are losing nurses, who are being paid as much as \$185 per month, because they cannot get along on that amount and because they can get much more in doing hospital floor duty.

"The range of salary for our sani-

tarrians varies from \$145 to \$245 per month, depending upon training and experience. This of course does not include the director of the Division of Sanitation who is an engineer. The lowest salary now received by our sanitarians is \$190, while the highest being paid is \$225 per month. One can see that it would be difficult for a man with a family to live under acceptable standards on \$190 per month. All of our sanitarians have outside sources of income to add to their salary which we pay, either by them or by wives working.

"The range of salary for clerks is \$80 to \$150. We pay \$120 as a starting salary to steno-clerks with experience. We are proposing to increase the salaries of all clerks and sanitarians by \$10 per month, the salaries of our laboratory personnel by \$15 per month, and the salaries of all nurses by \$50 per month. The latter will mean that our salaries for nurses will vary from \$195 to \$260 per month. The new nurse with no public health training or experience will receive \$195. However, this is still in competition with the \$200 which she can get doing floor duty in a hospital. Then, too, in a hospital position there is no salary deduction made as a contribution toward a retirement fund. I find that the young nurse would rather have the cash than make the contribution for retirement, although in this city it is matched with an amount equal to twice what she pays and the entire amount draws interest and is paid to an individual leaving our employment.

"I say advisedly that we are proposing these salary increases, for we have no money with which to pay the increases. After all, although our running costs have increased materially, our income or financial support has remained the same. Our department is supported by a one mill tax, plus certain state and federal funds. The latter are being reduced; therefore our only

hope for securing more money with which to pay higher salaries is to secure an increase in tax funds by vote of the citizens. This is a very difficult thing to do. So shall we continue our present staff at present salaries and expect to lose a number of employees, or shall we cut the number of personnel, and cut our program, so as to be able to pay higher salaries? Do you have the right answers? Any help that your 'Clearing House' can give us would be appreciated."

Wilson T. Sowder, M.D., Florida State Health Officer, has sent the Clearing House information about medical officers' salaries in Florida that may be both of interest and value to others. Between September, 1945, and March, 1947, official state and local health departments lost 20 full-time physicians—6 to private practice, 5 to other health agencies, and the remainder for other reasons—unknown, death, and retirement. During the same period it recruited 39 full-time physicians of whom 11 had had no previous public health experience; of the 28 with experience, 9 had had previous experience in Florida and 19 in other states. Only 4 came from other state health departments.

As of March 1, 1947 there were 12 full-time physicians on the staff of the State Health Department and 38 in county health departments. The annual salaries of 11 were \$7,200 or more; 21 received \$6,000 or \$6,600, and 18 received \$5,700 or less. Only 6 were without formal public health training or without experience prior to September, 1945, and of the 6, 2 had had inservice training of 3 months or longer.

In addition Dr. Sowder writes:

"At the moment we have two vacancies for physicians at the state level and one at the local level, but we are losing two excellent health officers within the next few months. We will be opening several new county health departments on July 1, and our total need

for health officers at that time will be about 8.

"So far we have had no difficulty filling positions for sanitary engineers or sanitation personnel but we plan considerable expansion in this field on July 1.

"We share a chronic shortage of nursing personnel along with the rest of the country, amounting to 15 to 20 per cent vacancies. The quality of applicants is not too good. We are also short of laboratory personnel and these positions are hard to fill.

"We are fortunate in Florida in that none of our salaries are limited by statute as is the case in many states and, as a matter of fact, in some state agencies in Florida. Under our law the salaries of county health department personnel are set by the State Health Officer with the approval of the Board of County Commissioners. There is no definitely established procedure for setting the salaries of central office personnel, but it is customary to get the Board's approval for such increases particularly for the higher salaries. When it was decided to set salaries as high as \$8,400, the Board felt it best to discuss the matter with the Governor although this was not required by law.

"Two newspaper stories, one in June, 1946, and the other in January, 1947, indicate that it is sometimes a good policy for a state health officer to pay salaries higher than his own. It seems to have worked very well here twice but I have no plans for trying it again in the immediate future."

William P. Scarlett, M.D., Health Officer, Little Rock, Ark.: "The employees of the Little Rock City Health Department are paid by the state and the city. We operate under a budget set up by the State Health Department according to Merit System Classification. The city matches funds allocated by or through the State Health Department. At the present time the state's

contribution is somewhat greater. Some of our employees are paid entirely by the state, some entirely by the city, and some by both.

"Due to the high cost of living, the city gave a mass increase to all city employees in September, 1946. Those earning \$200 a month or less received a 12 per cent increase, those earning from \$200 to \$300, 7.5 per cent, and those earning more than \$300, 5 per cent. Those paid entirely by the state were not included and those paid in part by the state received an increase only on the wage paid by the city. This caused a lot of ill feeling—e.g., an attendant received a nice increase in salary—more than some of the trained workers received who were being paid by the state and the city. The nurses who receive all their salary from the state received no raise at this time.

"January 1, 1947, the Merit System for State Health Department employees was revised upward a step or so and personnel was classified accordingly. The mass city raise put some of our employees above the Merit System Classification. Those paid entirely by the city have profited, those paid by the state and the city will not receive periodic increases from the state until they have absorbed the increase given by the city. Many of the employees paid entirely by the city cannot meet the minimum qualifications under the Classification plan.

"In December, 1945, we lost an efficient well trained chief nurse because we could not raise her salary. She had been with our department for more than 5 years before going to school to complete her B.S. in Public Health Nursing. She was the first chief nurse of our department and had helped develop our nursing program. At that time \$2,100 was the top salary. She resigned a couple of months after her re-

turn because she felt that she was worth more since she had received her degree. I believe I am correct when I say she had been with the State Health Department seven years before she came to the city. She was paid entirely from state funds after she became Chief Nurse of the City Health Department.

"We are losing an efficient secretary June 1, primarily because her salary has not been adjusted for two years to the Merit System Classification. The state feels the city should add the amount needed and the city stipulates salaries only by ordinance. We will not be able to replace the quality and quantity of work this person does at the salary she receives. She has been with the department 4½ years.

"During the war years we did not have a sanitary engineer. The state budget is set up at \$3,300 for a Senior Sanitarian. Last fall we had the opportunity of employing a well trained sanitary engineer and were successful in getting a city ordinance passed enabling the city to pay \$3,600.

"Last year it was also necessary to start paying a PBX operator two steps up instead of the starting salary, while we have a clerk who has been with the department for more than 5 years and does practically the same work but receives a smaller salary.

"The salary for the director of the local health department is now \$6,000 per annum. The state pays its share, but city ordinance has not been revised to meet the Merit System Classification. I could cite other cases in the department similar to mine.

"The City Comptroller has passed the word for all departments to cut budgets 10 per cent. We are certainly trying to do this without cutting salaries, but there is no way I know of to raise salaries from city funds at the present time."

# Credit Lines

## ROCKEFELLER FOUNDATION

### 1946 REPORT

The 1946 annual report of the Rockefeller Foundation (49 West 49th Street, New York) not only reports the number of millions of dollars that went into various fields of human activity—about two and a half million for public health, for the natural sciences, and the social sciences, nearly a million and a half for the medical sciences and the humanities, half a million for restoring the universities of China, a quarter of a million for an agricultural experiment program in Mexico, and smaller sums for equipping research laboratories in France, providing a research faculty in the social sciences at Nuffield College in England, and for research on the organic chemistry of natural products in Switzerland.

Even more, it has some cogent things to say about war's destruction of the human spirit and the "one world" that is a *sine qua non* of scientific progress.

"War not only destroys, it isolates; and isolation means intellectual stagnation. The flow of ideas across boundary lines, the free exchange of periodicals and books, the cross-fertilization of minds working in the same scientific and cultural fields—these are among the tragic losses of war. 'Speech is civilization itself,' says Thomas Mann. 'The word, even the most contradictory word, preserves contact—it is silence which isolates.' This enforced silence has brought losses which are in a sense irreparable—irreparable because they represent lost opportunities and lost time. The list of such losses is all the more formidable because it is blank.

"Invisible on this ghostly list are the beginnings of great new discoveries in genetics, in enzyme chemistry, in nutri-

tion. Perhaps a major entry on the list is the record of what might have been accomplished if all the energy and knowledge and unselfish coöperation which were devoted to making the atomic bomb had been applied instead to some of the great basic problems of biology and medicine."

The entire report will well repay the half hour or so required to read it.

## UAW STETHOSCOPE

In May, 1945 (p. 516), Credit Lines summarized briefly Michael M. Davis's *Survey Graphic* article on the opening of the United Automobile Workers Health Institute in the Edsel Ford mansion in Detroit.

In the second year of the operation of the Institute, it began the publication of a monthly publication, *The Stethoscope*. This is a colorful and interesting four page leaflet which gives a good deal of information on health matters and always has at least one amusing illustrative cartoon.

The Institute has three separate services, a medical diagnostic clinic, which diagnoses and refers the patient back to his private physician; health and safety education; and personal service. It is supported by per capita assessments of affiliated locals, the national office of the UAW-CIO and donations from the Detroit Community Chest. Full description of its history and functions will be found in *Public Health Nursing*, for September, 1946, in an article entitled "The Health Institute of the UAW-CIO."

## THE CHURCH CONSIDERS ALCOHOLISM

The recent biennial meeting of the Federal Council of Churches of Christ in America adopted a statement of

principles with respect to alcoholism.

"While recognizing the dual origin of alcoholism and excessive drinking in both personal instability and social pressures, and accepting the fact that alcoholism is a disease which requires treatment, the statement of principles reasserts the churches' conviction that the ethical aspects of the use of alcoholic beverages are underlined by concern on behalf of the victims of alcohol."

The Council therefore proposes a long-range, continuing scientific alcohol education program. As to social control of alcoholic beverages, it proposes (1) a revision of the alcoholic beverage tax structure in the direction of encouraging the dilution of proof spirits and fortified wines; (2) strict enforcement of laws regarding issuance of liquor licenses and regulation of hours of sale; (3) prevention of sales to minors; (4) social use of public revenue from the sale of alcohol, namely rehabilitation of alcoholics, relief of their families and repair of other social damages resulting from the use of alcohol; (5) regulation of alcoholic beverage advertising; (6) local option, namely freedom of neighborhood, community, or state to bar traffic in alcoholic beverages if a majority of the citizens agree upon such action; (7) indirect control of alcoholic consumption by the control of contributing factors, such as poor housing, inadequate recreation facilities, and broken homes, as well as through the transforming power of the Christian Gospel.

#### BIOGRAPHY OF DR. HURTY OF INDIANA

Dr. Thurman B. Rice, of the University of Indiana Medical School, and former Indiana State Health Officer, has just sent out the 96th and last chapter of his biography of John Newell Hurty, M.D. Begun as a serial in the January, 1939, *Bulletin of the Indiana State Board of Health*, the last chapter appeared in the issue of December, 1946.

It is a detailed, chatty, complimentary, and profusely illustrated biography written as a labor of love by Dr. Rice, who received his public health training and inspiration under Indiana's first and perhaps most famous state health officer.

The reprints of the biography, which Dr. Rice proudly says approximately equals in length Boswell's unabridged *Life of Johnson*, will be widely distributed among Indiana's schools, colleges, and libraries, as well as among the more important libraries and universities of the nation. One hundred copies are being reserved for foreign libraries. Dr. Rice has insured that posterity shall not forget John Newell Hurty, the Hoosier Health Officer.

#### LEPROSY IN VARIOUS PARTS OF THE WORLD

In March (p. 1313), *Credit Lines* brought you up-to-date on what is being planned for the National Leprosarium at Carville, Louisiana. Now comes the *March News Letter* of the Health and Sanitation Division of the Institute of Inter-American Affairs. It tells the story of "Santa Isabel," Paraguay's leper colony, where in September, 1946, a hospital and water supply system constructed by the Inter-American Cooperative Service for Public Health were turned over to the Paraguayan government. Generously illustrated with photographs this article describes Paraguay's leper facilities fully pointing out how the experience of the Louisiana institution has been used. Special emphasis has been placed on the preventorium for children born of parents with leprosy.

The same article describes Brazil's 26 preventoria briefly. These grew out of a layman's movement started by Mrs. Eunice Weaver in 1930.

Also at hand is the Easter and initial issue of the *Leprosy Digest*, published by the American Mission to

Lepers. This summarizes some of the activities being carried on by this church group in various parts of the world—China, Africa's Gold Coast, the Belgian Congo, and many others. It also has a lovely Easter legend of the dog-wood and how it came to be. Published at Suite 1017, 156 Fifth Avenue, New York 10.

#### RECOMMENDED CHANGES IN ENGINEERING CURRICULA

*The American Engineer*, March, 1947, publication of the National Society of Professional Engineers, carries an account of the report of the society's Committee on Education presented at the Annual Meeting in Atlanta on December 8, 1946.

Of particular interest to all engineers is the recommendation that all basic engineering courses be extended to five years to enable qualification for an engineering degree. A further recommendation is to the effect that 20 per cent of the credits in any course of engineering be acquired in the study of literature, English, writing, public speaking, economics, business administration, history, U. S. Government and its advantages, sociology, psychology and contract law. They continued their recommendations with the following: "That the National Society of Professional Engineers give prompt consideration to ways and means to expand the proposed five year minimum into a minimum six year program as soon as that can be accomplished. We realize that this will take time."

#### "DISASTER" WOULD PREVENT DISASTER

March, 1947, saw the birth of *Disaster*, a monthly publication of the Red Cross devoted to the broad field of disaster relief and prevention. "Disaster prevention must begin in the minds of man. To provide the facts needed to blast fatal it-can't-happen-here attitudes, this publication will

report month by month news of disasters in the nation," declares the first issue.

Cover pages of the first two issues are a Currier Ives reprint of the great Chicago fire and John Stewart Curry's "The Mississippi" (in flood). It is designed to inform not only chapter directors of disaster relief but the general public as well.

#### RAILROADS AND TYPHOID FEVER

In 1903 an article entitled, "An Unappreciated Source of Typhoid Infection," by Dr. Paul B. Barringer, dwelt on the possible danger that existed along railroad right of ways, due to improper disposal of human excreta from railway conveyances. Dr. Barringer visualized this danger as real and grave. He considered the possible spread of typhoid through this condition by: (1) drinking water infected by the excrement from passing cars or washed from the roadbeds of railways; (2) infection to persons handling contaminated ties, earth, and dust of the roadbed, and (3) infection caused by constant exposure to the clouds of dust raised by passing trains. Over the years this theory has had widespread acceptance, although definitive proof has been lacking.

One of the early projects undertaken through the newly organized Sanitation Research Project of the Association of American Railroads (*A.J.P.H.* 37, 3:345) was the investigation of this theory and of means for a better disposal of sewage waste. A report dated November 8, 1946, and submitted by Kenneth E. Maxcy, M.D., entitled "An Inquiry Into the Public Health Hazard of Sewage Disposal from Railway Conveyances," gives the results of the investigation. An exhaustive search of the literature, United States and European, failed to substantiate the theories advanced, according to Dr. Maxcy. An extensive list of references is included.

## RESEARCH ON FROZEN PRECOOKED FOODS

A recent article, "Microbiological Aspects of Frozen Precooked Foods," by B. E. Proctor and A. W. Phillips, Jr., appearing in the January, 1947 issue of *Refrigerating Engineering*, outlines certain experimental work done by the two authors in an effort to determine possible hazards to health that might exist in frozen precooked foods due to biological contamination.

The results of their study, as listed under their summary, indicate that "not all frozen precooked food products being manufactured and sold today are subject to either constant or strict bacteriological control." They find a need for bacteriological control of such foods and they point out the importance of extreme care in all the manufacturing operations combined with immediate freezing and continued storage at below zero temperatures until the food is ready to be prepared for consumption by the ultimate consumer. They also advocate some method of coding packages with the date of preparation and the packager.

## DO YOU HAVE A GARAGSMAN FRIEND?

If so, you'll be interested in the booklet, *Prevention of Health Hazards in Repair Garages*, published by the Departments of Labor and Industries and of Health of the State of Washington. Even if you do not have a friend in the garage business you should be interested in this illustrated discussion of the dangers present in repair garages due to carbon monoxide, paint sprays, faulty illumination, fire hazards, etc. What is more, you should know the preventive measures listed in the booklet.

## FEDERAL AND STATE STANDARDS FOR MILK PRODUCTS

The Bureau of Dairy Industry, Agricultural Research Administration, U. S. Department of Agriculture, recently published a compilation of data that

should be of interest to many health workers. The title of the report is "Federal and State Standards for the Composition of Milk Products." It was published in February, 1947, and bears the code number BDIM-Inf-45.

Under appropriate headings it shows the federal and individual state standards for various milk constituents and products, such as whole milk, skim milk, ice cream, cheddar cheese, etc.

## ROTARY'S CANCER QUIZ

The April, 1947, *Rotarian*, the organ of the Rotary Clubs of America, has a Quiz on Cancer. Prepared in collaboration with the American Medical Association, it has the answers to questions most commonly asked. It is an excellent presentation for the lay reader and should be useful in spreading correct information about this much feared and little understood disease.

## HEALTH HORIZON

The British National Association for the Prevention of Tuberculosis has forwarded the January issue of *Health Horizon*. This quarterly devoted to health education is now in its second year. By 1948 it hopes to be a bimonthly. It is a bright, informative, small magazine of some sixty pages that belies England's current austerity. Its January prescription for health is, "Take this magazine four times a year, dilute it with your commonsense, read it before meals and after meals—and you will know more about yourself, and therefore be healthier."

## MISSOURI RECOMMENDS COUNTY HEALTH UNITS

By way of educating the citizenry of the state, John W. Williams, M.D., the Director of Local Health Administration in the Missouri State Health Department, has prepared a pamphlet entitled "You Can Have One." With a picture of the attractive Neosho-Newton

County Public Health Center on the cover, it asks and answers some 20 questions about what county health units are and how a community may have one. It gives simple instructions as to how cities and counties can coöperate in setting up a health department, and how several counties may join in forming a health district as provided by recent legislation in Missouri.

#### CANCER NEWS IS NEW

Granville W. Larimore, M.D., director of the American Cancer Society's Education Department, sends us the first two issues of *Cancer News*. Beginning in January, 1947, this replaces the Society's *Field Army News* which was first published in 1942. The *News* is planned to become an educational journal on cancer for the interested layman. It is a very attractive magazine on good paper with excellent photography and graphic illustrations.

#### THE STATE OF COUNTY HEALTH SERVICES IN OREGON

In three recent issues of the weekly *Oregon Health Bulletin*, Oregon citizens are made acquainted with their county health services. Using Dr. Emerson's *Local Health Units for the Nation* as a springboard, Dr. Richard H. Wilcox, Director of the Division of County Health Units, tells why counties are without organized service and why theoretically organized counties are without personnel. Consolidation of counties for currently unserved areas and higher salaries to workers in organized counties are his two chief prescriptions. He does a very good job of outlining the Oregon situation in the background of the national situation and also of relating his discussion to the proposed health unit bill under consideration by the Oregon legislature. The series is well written and manages somehow to convey the idea that the author is taking the citizens into his

confidence rather than admonishing them. His definition of health departments is worth repeating, "packaged units of professionally trained men and women who are charged with the duties of rendering a half dozen essential primary services of public health to the people."

#### WORTH ACQUIRING

*Tuberculosis Basic Facts in Basic English* is a new edition of a popular National Tuberculosis Association booklet designed to help the physician, nurse, and social worker explain tuberculosis to a patient and the family. Available from state and local tuberculosis associations.

*Guide to Health Organization in the United States*—To meet the need for a ready reference guide to health organization in the United States, Joseph W. Mountin, M.D., and Evelyn Flook have prepared this pamphlet published by the U. S. Public Health Service. It brings together in brief and simple form the salient functions of the many agencies that render health services in the country. The respective contributions to public health of federal, state, and local official and voluntary agencies and of private physicians, dentists, nurses, and sanitary engineers are clearly defined. The result is a panoramic view of the health structure of the nation. It should be of help in orienting professional public health workers as well as American students and visitors from other countries. U. S. Govt. Ptg. Office, Washington 25, price 20 cents.

*For You and Yours* is prepared by the Federal Security Agency to tell citizen Joe how the agency touches his life and that of his family, including the aged and the handicapped. There is a very good double page chart that relates all federal services to the local community agency, school health depart-



ment, welfare department, etc., which is the point of contact for these services in which, it is said, the federal agency carries its share of the partnership. Also it has a list of dates when the various Federal Security Services began, the earliest being the Public Health Service in 1798. Appears to be available without charge from the Federal Security Agency, Washington 25, D. C.

*How to Live Longer*—A restful looking blue and white pamphlet by Liberty Mutual Insurance Co. (Boston), on the dozens of ways to prevent accidents in the home. Reminding the reader that he is 100 times more likely to be hurt than killed, it describes, and illustrates the kitchen, the "hot spot" of the home for burns, scalds, explosions. Stairway hazards, bad labeling in medicine closets, junky cellars and attics are all rounded up. Finally it is suggested that you be your own safety expert, going through

each room and finding and eliminating the booby traps. Most accidents have two causes, the physical circumstances and a mental lapse.

#### WORTH QUOTING

Speaking of the \$1,000,000,000 needed for relief in Greece, Turkey, and Korea, Jennings Perry in *PM* of March 26 declared, "The way to grasp an unknown quantity, of course, is to relate it to something that is known. For instance 1 billion is just 1/262 of the national debt, and obviously, looked at that way, not such a much. On the other hand, it would buy us at home complete TVA-model control of (1) the Ohio, (2) the St. Lawrence, or (3) the Arkansas. It would build, equip and endow us modern hospitals in 1,000 American towns. It would wipe out venereal diseases, smallpox, typhoid, and maybe cancer. And looked at that way it is right considerable."

---

## University of North Carolina

The Department of Public Health Nursing, School of Public Health, University of North Carolina, announces a change in the curriculum leading to a certificate in Public Health Nursing.

Beginning September, 1947, the curriculum will consist of three-quarters academic work, plus one-quarter field work.

In addition to the certificate program, the School of Public Health offers a Bachelor of Science degree in Public Health Nursing.

The School of Public Health also offers an M.P.H., or a Master's degree may be obtained in Sociology or Education.

## BOOKS AND REPORTS

*reviews are prepared on invitation. Unsolicited reviews cannot be accepted. books reviewed in these columns may be purchased through the Book Service.*

**Adjustment to Physical Handicap and Illness: A Survey of the Social Psychology of Physique and Disability**—By Roger G. Barker, Beatrice Wright and Mollie R. Gonick. New York: Social Science Research Council, 1946. 372 pp. Price, \$2.00.

The title of this book does not prepare one for the wealth of material contained between its covers. The insight of the authors in dealing with the psychosomatic approach to many problems the handicapped should make this a valuable reference for the medical and allied professions regardless of each one's special interest.

The book abounds in interesting reports of study and control groups used in this study. A few examples are: the handicaps of slight normal variations such as obesity or extremes in height; our personal reactions and how they come about; our nicknames, jokes, fiction and drama as they give us narcissistic satisfaction or fear. The influence of physique upon behavior and behavior upon physique are studied in providing background for consideration of the more specific problems of the disabled veterans and other civilians who must accept their handicaps and adjust them to our society. Problems of those with orthopedic and other physical disabilities are analyzed, as well as those of the acutely ill. We of the professional field are apart from the patient who enters on a terra incognita to him. He is insecure, unstable, and dependent upon us. We in turn may easily turn him to infantilism in his reactions because of circumstances beyond his personal control.

The authors have applied their psychology to the extent that the book is written in such a manner as to have the reader easily identify himself and those about him. In no way do the authors spoon-feed the reader. However the book demands a thoughtful approach to the hypothesis presented, both because of the vague nature of our social concepts and because of the presence of the human equation in the behavior of disabled people.

A final chapter deals with rehabilitation and employment of the handicapped, giving the application of principles learned in the war years. The approach is from the point of the patient as he meets the common problems of today. .

The book is well organized and comprehensive, yet written in an interesting style, and completely indexed. The extensive bibliography is most inclusive.

MARGARET P. LADD

**The Compleat Pediatrician**—By Wilbur C. Davison, M.D. (5th ed.), 1946, unpagged (256 numbered items). Price, \$3.75.

This perennial favorite has gained strength in the war years. It boasts of changing 10,000 lines in this edition, and now stands alone on its own feet with almost no references. Discussions on chemotherapy and infectious and tropical diseases have been greatly expanded. It is still probably useful chiefly to those physicians who are as well versed in pediatrics as the author and who admit, as he does, that the book should "jog his memory on possibilities, but it cannot do his thinking for him." Actually

the volume can be used only by those who are sufficiently earnest to find out how to use it. It is not to be read consecutively but is a cross-referenced handbook.

The public health expert will be pleased at the amount of information on prevention of disease and on growth and development of normal children. He should perhaps be concerned that the author apparently does not read this *Journal*. In its columns the reviewer of the fourth edition called attention to the sentence, "Sex: The ratio of males to females at birth is 1,043 to 1,000, and is higher in rural areas, immediately after wars and in Greece." It remains unchanged in this fifth edition. But that is no reason to scorn a thin pocket book which answers most of the questions those who deal with preventive and curative medicine for children may have.

LEONA BAUMGARTNER

**Health Insurance in the United States—By Nathan Sinai, Dr.P.H.** New York: The Commonwealth Fund, 1946. 115 pp. Price, \$1.50.

Another in the outstanding series of monographs under the aegis of the New York Academy of Medicine, this is an able discussion by an able authority and his associates. Its seven chapters carry the reader through a well organized sight-seeing tour of the evolution of the health insurance movement, both hospital and medical, in this country.

In common with all good conductors of tours, at least one of the authors has interspersed touches of his own adroit philosophy. These are interesting and worth while both in commission and omission but their presence should not be lost upon the objective reader.

This is a most valuable book. But so rapidly has this problem been advancing that need for a revised edition can already be seen. A series of supplemental articles is suggested pending

such. We hope the authors will perform this service.

EDWARD S. ROGERS

**A Blind Hog's Acorns—By Carey P. McCord, M.D.** Chicago: Cloud, Inc., 1945. 311 pp.

Any book explaining and popularizing public health is of special value in these days of shortage of public health personnel. Carey P. McCord dramatizes and enlivens the industrial health field in a series of charming stories, reflecting the vast importance of this field, while entrancing his reader with the art of the true raconteur, an art which his friends have long enjoyed when with him on field trips, at the luncheon table, and at meetings. This little biographical book brings the industrial preventive medicine story to the public with an effectiveness that ranks with *An American Doctor's Odyssey*, *Plague on Us*, and *Yellow Jack*.

The puzzling title is quickly explained in the first pages and becomes uniquely apropos when we learn that the author's childhood was warped by the edict of an itinerant phrenologist, who pronounced his "bumps all wrong—his head proves he just ain't fitten," whereupon his father decided he was still worth rearing since "even a blind hog gets an acorn once in a while." Thereafter the book contains such a surprising collection of tasty acorns of wit and wisdom, as to leave no question of the father's sound judgment.

As might be expected of one of his erudition, the author, try as he will to avoid it, lapses into technical language occasionally, having expressed himself thusly all these years. But the terms are easily understood and are used in a way which flatters the non-medical reader's intelligence. His basic tenet, that "a little piece of man" goes into every job performed by man, and that this constitutes a day-by-day process of attrition of body and mind, is well illustrated, and

becomes the basis of the industrial hygienist's creed: to reduce that process to a minimum. His pursuit of the "chiclero's disease" in the jungle of Central America and finding it to be leishmaniasis, the "four o'clock mystery" when all workers in a large office became ill at four each day, his many experiences with the legal fraternity, his investigations of lead and dust hazards, and many other important contributions made to the young science of industrial hygiene are woven into nicely connected stories told with modesty, humor even at his own expense, and a rare piquancy. The illustrations by Strobel add much to the humor and style. This is good recreational as well as philosophical reading for anyone.

W. P. SHEPARD

**Practical Physiological Chemistry**  
—By Philip B. Hawk, Ph.D., Bernard L. Oser, Ph.D., and William H. Summer-  
son, Ph.D. (12th ed.) Philadelphia:  
Blakiston, 1947. 1,323 pp. Price,  
\$10.00.

Biochemists and many others will welcome the new edition of this classic. Something of the growth of the science is indicated by the increasing size of the work; the 8th edition (1923) contained 693 pages; the present edition contains 1,323 pages and employs a smaller type size. The various sections of the book have either been completely rewritten or revised by the addition of new material. The following are among the new procedures and methods included in this edition: electrophoresis patterns of blood plasma; spectrophotometry, flame photometry, and photofluorometry, including the theory and use of nearly all of the instruments now in common use (Evelyn, Beckman, Pfaltz, and Bauer, etc.); assay methods for the vitamins, including bioassay, microbiological assays, chemical, and fluorometric.

For two decades this reviewer has

been looking for a laboratory manual in biochemistry which was compiled with consideration given to simplicity and uniformity of reagents required. This is not the book. For example, the laboratory procedures given in the first 400 pages require no less than 28 *different* concentrations of HCl.

As was true of the former editions, the new Hawk will be widely used by teachers of biochemistry, but it will be no less useful to physicians, medical biochemists, and technologists, physiologists, and investigators in biochemistry. Many will find it indispensable.

PAUL L. DAY

**International Health Conference,**  
New York, N. Y., June 19–July 22,  
1946. *Report of the United States*  
*Delegation, including the Final Act and*  
*Related Documents.* Washington: U. S.  
Gov. Ptg. Office, 1947. 145 pp. Price,  
\$.35.

The report of Dr. Thomas Parran as Chairman of the United States Delegation to the International Health Conference of 1946 has been published by the U. S. Department of State, and is a document which should be widely distributed in libraries in order that the Constitution of the World Health Organization and something of its procedure and the interim arrangements which have been made following the Conference should be widely understood.

REGINALD M. ATWATER

**Layout, Building Designs and**  
**Equipment for Y.M.C.A. Camps—**  
*Prepared under direction of John A.*  
*Ledlie. Building & Furnishing Service*  
*National Board, Y.M.C.A. New York:*  
*Association Press, 1946. 48 pp. Price,*  
*\$3.00.*

This is an attractively printed brochure prepared to suggest components for a Y.M.C.A. camp with a capacity of 125. Floor plans give room arrangements and crude dimensions. Archi-

pects' sketches illustrate most buildings discussed. The purpose of the brochure is to depict an ideal plan which could be reduced as funds necessitated. There is a good general discussion of the need for proper sewage disposal and the typical parts of a satisfactory disposal system, although many will disagree with some of the operative characteristics given. This discussion is quite general; it does not give detail for any phase of camp construction or operation.

FRANCIS B. ELDER

Survey Report of the Salary Standardization Board. *Albany: New York State Civil Service Department.* 301 pp. Price, \$1.50.

The first finding of this report is: "In the main, gross salaries presently paid (including emergency compensation), are comparable with and in proper relationship to salaries paid in private industry and in other public jurisdictions," and the recommendation is: "The present emergency compensation should be made permanent and incorporated into the basic salary structure."

In the schedules used for the past decade, 13 occupational services were provided, with 194 salary grades. This report recommends a general schedule of 50 grades with no divisions into services, in which the lowest salary begins at \$1,500 and rises to a maximum of \$2,100 at the sixth year. The highest for which increments are stated begins at \$10,500 with a maximum of \$12,500. Decisions as to how workers in certain fields will fit into the general schedule of Grades 1 to 50 will be completed by October 1, 1947. The report states: "Estimates made show that the added adjustments necessary to convert the present gross salaries to the proposed salaries will average slightly over \$50 per employee, and will cost the state about 2.5 million dollars." Although 52,500 is frequently used as the number

of state employees, a frequency table of only 39,337 salaries is given. This table affords a median of \$2,319. The average salary is stated to be \$2,448. Thus, the additional 2.5 million dollars is an increase of almost 3 per cent for the total payroll.

Average salaries for accountants, librarians, personnel administrators, and public health nurses employed by the federal government appear distressingly high to the New York State Board. The graphs comparing salaries in various fields in private industries, federal government, other states, and New York State are interesting.

Job descriptions occupy 213 pages, and some titles will be described later. Among those of interest to readers of the *American Journal of Public Health* are physical therapy technician, physician (institutional work), public health nurse, senior psychiatrist, social worker, statistician, stenographer.

Personnel practices in other areas of employment were found to be, with one exception, more liberal for New York State employees. The policy about overtime pay was the exception.

A very interesting table to the 52,500 employees of the State of New York will be the one which shows to what proposed grades their present grades will be transferred.

DOROTHY E. WIESNER

If You Ask My Advice—By *Henry Pleasants, Jr., M.D.* Boston: *Bruce Humphries, Inc.*, 1946. 110 pp. Price, \$2.00.

The author presents a "brief and somewhat informal essay" on a number of general popular topics, such as insanity, alcoholism, drug addiction, sex, child and family problems, etc. The style is sketchy and anecdotal and the treatment is so superficial that one feels little has been accomplished. Dr. Pleasants has had a diversified medical experience and has written several

books, one of which was a Book-of-the-Month selection. Excellent writing ability is evidenced in this small booklet, but the quality and quantity are insufficient to satisfy the reader with the advice given.

CHARLES E. SHEPARD

**What Do You Know About Blindness?** By Herbert Yahraes, *Public Affairs Pamphlet No. 124. New York: Public Affairs Committee, 1947. 32 pp. Price, \$1.10.*

The public health worker will want to have at least the minimum information that is in this well written pamphlet about a condition which affects one in 600 Americans, whether or not he has a friend who is blind. Discussion of causes and prevention is condensed to a few pages, but in general this provides a good summary.

The statement that "... school work is bound to make worse ..." uncorrected defects of vision is based on coincidence rather than scientific evidence. It is true that myopia, for example, is greater in the older grades; many ophthalmologists feel that this comes about from natural growth processes rather than from the conditions under which eyes are used. More light is needed on this and other problems. On the other hand, there are certain less common eye conditions, such as high myopia, in which special educational adjustments based upon medical recommendations definitely are indicated.

FRANKLIN M. FOOTE

**Tuberculosis in the United States.** Prepared by Field Studies Section of the Tuberculosis Control Division of the U.S.P.H.S. New York: National Tuberculosis Association, 1946. 189 pp.

Volume 4 of the series titled "Tuberculosis in the United States" was preceded by one volume annually since 1943. The first three volumes covered mortality statistics and proportionate

mortality statistics for states and geographical divisions, and mortality statistics for cities of 100,000 or more population—all by age, sex, and race.

The present volume covers mortality statistics in a similar manner for smaller population groups. The graphic presentation gives a bird's-eye view of the data so that "he who runs may read."

Inasmuch as the figures pertain to the status existing from 1939 through 1941 they are not new.

A striking fact is that while in the white population the death rate in urban places was not much greater than in rural areas (38.1 as compared with 35.1), the rate for non-whites in urban places was 72 per cent greater than in rural areas (169.8 as compared with 98.3).

JOHN H. KORNS

**Tutoring as Therapy—**By Grace Arthur, Ph.D. New York: The Commonwealth Fund, 1946. 125 pp. Price, \$1.50.

On the central theme of the child's necessity to be able to compete on equal terms with others of his group, Dr. Arthur presents, in a smoothly integrated blend of exposition and case history, some of the obstacles to group learning which render children insecure and the methods by which tutoring can overcome these obstacles.

Drawn largely from a tutoring project set up during the depression, the material illustrates the usefulness of tutoring in school failures resulting from illness, home maladjustments, inferior mental equipment, physical incapacities, intellectual idiosyncracies, and special disabilities.

Consideration is given to the qualifications of tutors, to family and community coöperation, and to the limitations of the method. Special emphasis is laid upon the rôle of the psychologist as mentor and guide.

Of interest primarily to teachers and psychologists, this small readable book

is provocative and enlightening to all workers in the field of family health, partly by reason of its indirect reëmpphasis on the values of agency coöperation. MARGARET E. MAHIN

*Your Community*—By Joanna C. Colcord. A revision by Donald S. Howard. New York: Russell Sage Foundation, 1947. 263 pp. Price, \$1.50.

The revision of *Your Community* by Joanna Colcord brings to date a valuable publication to the public health field.

Health education workers recognize that man does not live to himself alone and that his health problems are involved in the social problems of his environment. Miss Colcord's book gives a mechanism through which persons may become aware of community problems and their relationships. It is valuable for study groups who wish to make a contribution to the welfare of their communities.

The chapters dealing with health and medical care have been expanded, and that on housing, planning, and zoning offers some thought-provoking questions to public health workers.

The book is of value to students in schools of public health as well as to workers in the field. The Russell Sage Foundation has done well to present this revision by Donald S. Howard.

MARY P. CONNOLLY

*The Modern Attack on Tuberculosis* — By Henry D. Chadwick, M.D., and Alton S. Pope, M.D. New York: The Commonwealth Fund, 1946. 123 pp. Price, \$1.00.

This outline-manual covers its subject briefly and should interest all health officers and administrators charged with the planning of tuberculosis

control programs. It has both an index and a bibliography.

The authors outline programs for a tuberculosis control division in a state health department and for county and city departments. They regard as essentials in such programs (1) coöperative medical profession, (2) readily available x-ray and laboratory service, (3) well run tuberculosis hospitals, (4) case register and public health nursing service in the health department, (5) a director qualified in both general public health and tuberculosis. They emphasize the continuing need for consultation clinics of high caliber, intensive follow-up of patients and suspects, mobile clinics with x-ray equipment, and more x-ray examination of mature and elderly adults (particularly men).

This should prove a valuable reference book for physicians and nurses engaged in tuberculosis control.

ALAN L. HART

*Nursing for Community Health*—By Theda L. Waterman, R.N. (2nd ed.) Philadelphia: Davis, 1947. 421 pp. Price, \$3.50.

The second edition of Miss Waterman's book presents fresh bibliographical, illustrative, and text material for the use of students in schools of nursing. As the author herself states, the program of public health is both simple and complex, and to select that which is most important to give the student a broader understanding of community health is not easy. The author has chosen the fields of community service commonly covered by public health nurses and describes briefly the agencies concerned therein. The bibliographies are generous and part II offers a teaching and study outline which will be helpful to instructors.

DOROTHY DEMING

## A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

**Not One But Five Dollars Needed**  
—On a budget of about a dollar a day per patient, mental hospitals (public) are expected to provide board, room, clothing, entertainment, medications, and high-grade medical and nursing care. That is one measure of our reluctance to face realistically the pressing psychiatric problems of our day.

ANGUS, L. R. The Challenge of Psychiatry in 1947. *Canad. Pub. Health J.* 38, 4:157 (Apr.), 1947.

**Good News for You as Citizen or Sanitarian** — Experience with DDT spraying of dairies, restaurants, and small food shops leads to the conclusion that effective control of houseflies may now be achieved by an individual, a business, or a community.

BAKER, W. C., *et al.* The Control of Houseflies by DDT Sprays. *Pub. Health Rep.* 62, 17:597 (Apr. 25), 1947.

**Sans Billingsgate**—Do make an effort to hunt this one out! It describes the revolutionary changes about to take place in British medical, hospital and health services. The whole tone of the letter is good natured, fair, and frank. When, do you suppose, will we achieve the adult ability to discuss controversial issues unemotionally?

BROCKINGTON, F. Letter from Great Britain. *Canad. Pub. Health J.* 38, 4:207 (Apr.), 1947.

**Entre Nous**—Just what governs the choice of items annotated here? Please don't answer, the Lord only knows! One qualification is that the item appear in one of the scientific or professional periodicals reasonably accessible to health people generally. Another is that it be of some interest, presumably, to a large number of our *Journal's* readers. This little excursion is prompted

by my decision not to comment on a paper on vaccine manufacture which, I suppose, is of practical moment to not more than ten readers, and to them, it is of such immediate importance that they will know all about it. (Also this confession saves me the trouble of reading it.)

DUCOR, D. H. An Improved Method of Producing Smallpox Vaccine of Low Bacterial Content. *Pub. Health Rep.* 62, 16:565 (Apr. 18), 1947.

**Contrary to General Pediatric Opinion**—For premies, cows milk properly modified will produce greater gains in weight than human milk, say these researchers.

GORDON, H. H., *et al.* Feeding Premature Infants. *Am. J. Dis. Child.* 73, 4:442 (Apr.), 1947.

**To Be Tucked Away**—Another report that penicillin-treated scarlet fever patients had fewer complications than those treated with convalescent serum or sulfonamide drugs.

HOYNE, A. L., and BROWN, R. H. Penicillin for Scarlet Fever. *Med. Officer.* 77, 15:143 (Apr. 12), 1947.

**Penalties of Progress**—New methods of treatment for gonorrhea and syphilis have brought almost as many problems as blessings. This challenging introduction to a paper you will want not to miss should be enough to send you to it. You'll profit by the paper that follows it, too, once you get started.

INGRAHAM, N. J., JR. Treatment Progress in Venereal Disease Control (and) PICKENS, M. E. The Nursing in a Changing Venereal Disease Program. *Pub. Health Nurs.* 39, 5:250 (May), 1947.

**Five-Year Health Plans**—Among other things that the Russian health



authorities are attempting, is routine administration of BCG to all new-born. Adults under special risk are given the protection, too.

MUDD, S. Programs for Medicine and National Health in the USSR. *Science* 105, 2724:269 (and) 105, 2725:306 (Mar. 21), 1947.

**Paper-of-the-Month** — That much discussed report upon the possibilities of bacterial warfare is here. Being in the line of business you are, you will want to be able to say "Yes, I've read it." You can get a reprint by sending one dollar to the publisher (Williams and Wilkins). Perhaps you should be warned that the paper is of a pre-war vintage and is based upon data published prior to 1942. There is nothing in it about secret research conducted since that time by the military.

ROSEBURY, T., and KABAT, E. A. Bacterial Warfare. *J Immunol.* 56, 1:7 (May), 1947.

**Excuse This Please**—This is, of course, of professional interest only to you, but you will be glad to know that DDT kills cockroaches and bedbugs too.

STENBURG, R. L. The Techniques of Application and the Control of Roaches and Bedbugs with DDT. *Pub. Health Rep.* 62, 19:669 (May 9), 1947.

**For Pleasure First, Then Profit**—Here is that rarity in the scientific press, an amusing though profound dissertation. One sentence: "To be sure we do have encyclopedic consultants, who on the push of a button spout Information

Please or what might be degraded by the designation 'info'."

STOKES, J. H. What Is a Consultant? *Pub. Health Nurs.* 39, 5:239 (May), 1947.

**Five Ways to Reduce Measles Morbidity**—If you are looking for a brief, well organized, practical statement about what's new with measles prevention, and treatment, then you'll find it here. Nothing sensational, to be sure, but a good workman-like review.

TOWSLEY, H. A. Measles. *Am. J. Nurs.* 47, 5:278 (May), 1947.

**Department of High Aims**—Within 5 years, if all resources are mobilized, a complete picture of tuberculosis in the United States can be obtained. The goals of the USPHS are the discovery of all tuberculous persons, medical care of every patient needing treatment, after-care and rehabilitation, and protection of families against economic distress. This paper is about the mechanics of reaching the first goal.

WEBER, F. J. Community-wide Chest X-Ray Surveys. *Pub. Health Rep.* 62, 18:652 (May 2), 1947.

**Epidemiologic Note** — Penicillin shortens markedly the duration of the convalescent and chronic carrier states if given in sufficient quantity to patients with diphtheria. The drug has no beneficial effect upon the clinical course of the disease, reports this researcher.

WEINSTEIN, L. The Treatment of Acute Diphtheria and the Chronic Carrier State with Penicillin. *Am. J. M. Sc.* 213, 3:308 (Mar.), 1947.

## BOOKS RECEIVED

*Listing in this column acknowledges the receipt of books and our appreciation to the senders. Space and the interests of readers will permit review of some, but not all, of the books listed.*

- THE ACUTE INFECTIOUS FEVERS. By Alexander Joe, D.S.C. Philadelphia: Blakiston, 1947. 276 pp. 64 illus. Price, \$4.50.
- BABIES DON'T BOUNCE. By Bil Sullivan. New York: McGraw-Hill, 1947. 48 pp. Price, \$1.50.
- CAREERS FOR NURSES. By Dorothy Deming, R.N. New York: McGraw-Hill, 1947. 358 pp. Price, \$3.50.
- CLINICAL PRACTICE IN INFECTIOUS DISEASES. By E. H. Harries, M.D. and M. Mitman, M.D. (3rd ed.) Baltimore: Williams & Wilkins, 1947. 679 pp.
- COMMON CONTAGIOUS DISEASES. By Philip Moen Stimpson, A.B., M.D. (4th ed.) Philadelphia: Lea & Febiger, 1947. 503 pp. Price, \$4.00.
- ESTIMATION OF THE VITAMINS — Biological Symposia. Edited by W. J. Dann and G. Howard Satterfield. Lancaster: Jaques Cattell Press, 1947. 531 pp. Price, \$6.50.
- EXPERIENCES WITH FOLIC ACID. By Tom D. Spies, M.D. Chicago: Year Book Publishers, Inc., 1947. 110 pp. Price, \$3.75.
- GENERAL BIOLOGY. By Perry D. Strausbaugh, Ph.D., and Bernal R. Weimer, Ph.D. (2d Ed.), New York. Wiley, 1947. 718 pp. Price, \$4.75.
- METHODS OF VITAMIN ASSAY. Prepared and edited by The Association of Vitamin Chemists, Inc. New York: Interscience Publishers, Inc., 1947. 189 pp. Price, \$3.50.
- MILK AND FOOD SANITATION PRACTICE. By H. S. Adams, B.Sc. New York: Commonwealth Fund, 1947. 311 pp. Price, \$3.25.
- THE MURINE TYPE OF TUBERCLE BACILLUS. Medical Research Council Special Report No. 259. By A. Q. Wells. New York: British Information Services, 1946. 48 pp. Price, \$.70.
- UNITS IN PERSONAL HEALTH AND HUMAN RELATIONS. By Lillian L. Biester, et al. Minneapolis: University of Minnesota Press, 1947. 267 pp. Price, \$3.50.
- OUR RURAL COMMUNITIES. By Laverne Burchfield. Chicago: Public Administration Service, 1947. 201 pp. Price, \$2.50.
- THE PRINCIPLES AND PRACTICE OF MEDICINE (Osler). By Henry A. Christian, A.M., M.D., LL.D. (16th ed.) New York: D. Appleton-Century, 1947. 1539 pp. Price, \$10.00.
- THE RANKS OF DEATH. By Colonel P. M. Ashburn. New York: Coward-McCann, Inc., 1947. 298 pp. Price, \$5.00.
- RECENT TRENDS IN ALCOHOLISM AND IN ALCOHOL CONSUMPTION. By E. M. Jellinek, Sc.D. Connecticut: Hillhouse Press, 1947. 42 pp. Price, \$.50.
- STANDARD METHODS OF THE DIVISION OF LABORATORIES AND RESEARCH OF THE NEW YORK STATE DEPARTMENT OF HEALTH. By Augustus B. Wadsworth, M.D. (3rd ed.) Baltimore: Williams & Wilkins, 1947, 990 pp. Price, \$10.00.
- STATISTICAL ANALYSIS IN BIOLOGY. By K. Mather, D.Sc., Ph.D. New York: Interscience Publishers, Inc., 1947. 267 pp. Price, \$5.00.
- THE SUCCESSFUL SECRETARY. By Margaret Pratt. New York: Lothrop, Lee & Shepard Company, 1946. 144 pp. Price, \$2.00.
- STUDIES OF TYPHUS FEVER. (National Institute of Health Bulletin No. 183). By N. H. Topping, et al. Washington: United States Public Health Service, 1945. 110 pp.
- TUBERCULOSIS AS IT COMES AND GOES. By Edward W. Hayes, M.D. (2nd ed.) Springfield: Thomas, 1947. 220 pp. Price, \$3.75.
- TUBERCULOSIS CONTROL HANDBOOK. Prepared by Members of the Tuberculosis Control Advisory Board. Chicago: United States Indian Service—Department of the Interior, 1947. 55 pp.
- THE ORIGIN AND DEVELOPMENT OF GROUP HOSPITALIZATION IN THE UNITED STATES 1890-1940. By J. T. Richardson, Ph.D. Columbia: University of Missouri, 1945. 101 pp. Price, \$1.25.

# ASSOCIATION NEWS

## AN ASSOCIATION COÖRDINATING COMMITTEE ON LABORATORY METHODS

The American Public Health Association has been a pioneer in establishing standards for laboratory work. Even before the Laboratory Section was founded in 1899, committees of the Association were active in studying Laboratory methods and recommending uniform procedures. Six reports preceded publication of the first edition of *Standard Methods of Water Analysis* in 1905. The committee appointed to study bacteriological methods for milk published the first edition of *Standard Methods for the Bacteriological Examination of Milk* in 1910.

Until the year 1920, such work was carried on independently by various committees of the Laboratory Section. At that time it was decided that more coherent work could be accomplished if these committees were consolidated into a single Standard Methods Committee. Such a committee was formed early in 1921 and under its leadership the methods for both water and milk carried through several editions.

As the interests of the Section expanded and it seemed desirable to provide uniform methods for a wide variety of laboratory examinations, it became apparent that no single committee could be representative of all the special fields involved, so in 1933 the standard methods machinery of the Laboratory Section was revised and a number of independent committees on laboratory methods were again set up. At this time the chairmen of these various committees were appointed to a new Coördinating Committee on Standard Methods, whose function was

to stimulate and coördinate the work of the several committees. Under this organization, the first two editions of *Diagnostic Procedures and Reagents* were published, the new volume on "Laboratory Procedures in Virus Diseases" is being prepared, *Standard Methods for the Examination of Dairy Products* was enlarged to include frozen desserts and ingredients, *Recommended Methods of Procedure for Bacteriological Examination of Shellfish and Shellfish Waters* was issued, and the A.P.H.A. responsibility for *Standard Methods for the Examination of Water and Sewage* carried through two editions.

Up to this point these committees have been organically a part of the Laboratory Section structure, although from time to time representatives of other Sections have been invited to serve on them. However, during the past few years, there has been an increasing expansion of interest in laboratory methods throughout the Association, extending far beyond the Laboratory Section. It is becoming increasingly evident that two groups of workers are interested in any laboratory method, a group actually performing the laboratory examinations and an equally important group applying the results of these examinations to field conditions and interpreting such application. The persons primarily interested in certain problems such as those of food technology are members of other Sections of the Association, even though these problems involve primarily laboratory procedures. This has led to a desire on

the part of several of the Sections of the Association to have a formal share in the preparation of laboratory methods, not only as technical procedures within a laboratory but also in the interpretation and application of laboratory results.

Recognizing the broad Association interests in all laboratory methods, the Committee on Research and Standards at the November, 1946, meeting in Cleveland appointed a special committee to consider the Association's present needs and to explore ways and means by which a coordinating committee could be formed to represent all those Sections of the Association which have an interest in laboratory procedures and their application. This committee was also instructed to investigate ways by which the time elapsing between the actual preparation of methods and their publication could be reduced from that

necessitated by existing requirements.

John F. Norton, Ph.D., and Reginald M. Atwater, M.D., were appointed as members of this special committee with authority to include additional members as deemed desirable. In consultation with Friend Lee Mickle, Sc.D., Edmund K. Kline, Dr.P.H., and Francis B. Elder, the following proposal for an Association-wide Coördinating Committee on Laboratory Methods has been developed.

It has been accepted in principle by the Engineering and Laboratory Section Councils and the Laboratory Section Coördinating Committee. Comments from the Membership of the Association will be welcomed and considered by the special committee in preparing its report and recommendation to the Committee on Research and Standards at the Annual Meeting in Atlantic City.

#### OUTLINE OF A SUGGESTED ORGANIZATION FOR AN ASSOCIATION COÖRDINATING COMMITTEE FOR LABORATORY METHODS

##### 1. Basic components of the Committee:

1.1 *The Coördinating Committee* to be a subcommittee of the Committee on Research and Standards. Members, from the appropriate Sections and/or from among the chairmen of Laboratory Methods Committees, will be appointed by the Committee on Research and Standards on the basis of their individual qualifications to perform the job assigned to the Coördinating Committee. The chairman of the committee will be regarded a member *ex officio* of the Committee on Research and Standards, if not already on that committee.

1.2 *The Chairmen of Laboratory Methods Committees* will be appointed by the Coördinating Committee; other members will be appointed by the chairman of the Coördinating Committee. All such appointments will be made in consultation with the Section Councils involved. The appointment of members of any Laboratory Methods Committee will be subject to approval by the Section Council of the Section to which the appointees belong. There shall be only one Laboratory Methods

Committee active in the preparation of "Methods" in any particular field. Appointment to "Methods" committees of persons not members of the American Public Health Association is permissible.

1.3 *The Coördinating Committee* shall appoint the A.P.H.A. representatives to any Joint Editorial Board concerned with interests of other organizations after approval of its nominations by the Executive Board. The Coördinating Committee shall also appoint any special editorial committees necessary for preparing A.P.H.A. Standard Methods Committees.

##### 2. Duties and Functions:

2.1 *The Coördinating Committee* will:

2.11 Assume leadership among existing Laboratory Methods Committees.

2.12 Establish Laboratory Methods Committees upon the recommendation of any Section or as deemed necessary.

2.13 In consultation with Section Councils involved, appoint a chairman of each Laboratory Methods Com-

mittee. Committee members will be appointed by the chairman of the Coördinating Committee after consultation with the chairman of the committee concerned.

- 2.14 Assure competent, adequate group review of any Laboratory Methods by its committee. This may extend to the preparation of guiding rules of procedure for any Laboratory Methods Committee.
- 2.15 Promote the preparation of new Laboratory Methods and timely review of existing reports.
- 2.16 Resolve controversial questions that may not be possible of solution in the committee involved.
- 2.17 Establish uniform style, format, etc., to be followed in the preparation of any Laboratory Method other than those under direction of a Joint Editorial Board.
- 2.18 Present to the Committee on Research and Standards completed manuscripts with the assurance that competent group judgment has been obtained in their preparation.
- 2.2 *Laboratory Methods Committees* will:
  - 2.21 Arrange for allocation of material to proper persons for preparation.
  - 2.22 Arrange for review of entire manuscript by the full committee.
  - 2.23 Refer irreconcilable questions to the Coördinating Committee.
  - 2.24 Prepare not only methods to be adopted as, "Standard Methods," but any others to be published.
  - 2.25 Assure coördination of views of those interested in the development of laboratory methods with those interested in the interpretation and application of those methods, and vice versa.
- 2.3 *Association Sections or Their Councils* will:
  - 2.31 Recommend to the Coördinating Committee the formation of new Laboratory Methods Committees as the need arises.
  - 2.32 Confirm appointments to a Laboratory Methods Committee of members affiliated with the Section.
  - 2.33 Request the Coördinating Committee for representation on any Laboratory Methods Committee

in which the Section is interested either from the laboratory or field implications.

2.4 *Joint Editorial Board Representative(s)* will:

- 2.41 Represent the Association in the preparation of uniform procedures and allocation of areas of responsibility to the organizations sponsoring the publications.
- 2.42 Refer back to the Coördinating Committee any subjects which cannot be settled by Joint Editorial Board action.
- 2.43 Be limited to editing duties. They will not have any judicial responsibilities.

It is believed that the chief weaknesses in the present Coördinating Committee functioning are eliminated under the proposed Committee on Research and Standards Coördinating Committee. It would assure representation of all Sections indicating their basic interest in the activities of a laboratory methods committee. Possible duplication of committees would be prevented. Representation of both the worker in strictly laboratory procedures and the field man would be assured by proper committee appointments. Formal Association adoption of a method would be simplified in that any text would clear the laboratory method committee preparing it, then go to the Committee on Research and Standards. Following approval by that committee, only Governing Council action would be required for adoption as an official Association volume.

### WHAT HAVE YOU FOR HEALTH EDUCATION HEADQUARTERS AT ATLANTIC CITY?

All health agencies are invited to send their health education and publicity materials to the National Publicity Council for possible inclusion in the portfolios now being prepared for display at the 75th Annual Meeting. The materials will be exhibited in the Health Education and Publicity Headquarters

- mittee. Committee members will be appointed by the chairman of the Coördinating Committee after consultation with the chairman of the committee concerned.
- 2.14 Assure competent, adequate group review of any Laboratory Methods by its committee. This may extend to the preparation of guiding rules of procedure for any Laboratory Methods Committee.
  - 2.15 Promote the preparation of new Laboratory Methods and timely review of existing reports.
  - 2.16 Resolve controversial questions that may not be possible of solution in the committee involved.
  - 2.17 Establish uniform style, format, etc., to be followed in the preparation of any Laboratory Method other than those under direction of a Joint Editorial Board.
  - 2.18 Present to the Committee on Research and Standards completed manuscripts with the assurance that competent group judgment has been obtained in their preparation.
- 2.2 *Laboratory Methods Committees* will:
- 2.21 Arrange for allocation of material to proper persons for preparation.
  - 2.22 Arrange for review of entire manuscript by the full committee.
  - 2.23 Refer irreconcilable questions to the Coördinating Committee.
  - 2.24 Prepare not only methods to be adopted as, "Standard Methods," but any others to be published.
  - 2.25 Assure coördination of views of those interested in the development of laboratory methods with those interested in the interpretation and application of those methods, and vice versa.
- 2.3 *Association Sections or Their Councils* will:
- 2.31 Recommend to the Coördinating Committee the formation of new Laboratory Methods Committees as the need arises.
  - 2.32 Confirm appointments to a Laboratory Methods Committee of members affiliated with the Section.
  - 2.33 Request the Coördinating Committee for representation on any Laboratory Methods Committee
- in which the Section is interested either from the laboratory or field implications.
- 2.4 *Joint Editorial Board Representative(s)* will:
- 2.41 Represent the Association in the preparation of uniform procedures and allocation of areas of responsibility to the organizations sponsoring the publications.
  - 2.42 Refer back to the Coördinating Committee any subjects which cannot be settled by Joint Editorial Board action.
  - 2.43 Be limited to editing duties. They will not have any judicial responsibilities.
- It is believed that the chief weaknesses in the present Coördinating Committee functioning are eliminated under the proposed Committee on Research and Standards Coördinating Committee. It would assure representation of all Sections indicating their basic interest in the activities of a laboratory methods committee. Possible duplication of committees would be prevented. Representation of both the worker in strictly laboratory procedures and the field man would be assured by proper committee appointments. Formal Association adoption of a method would be simplified in that any text would clear the laboratory method committee preparing it, then go to the Committee on Research and Standards. Following approval by that committee, only Governing Council action would be required for adoption as an official Association volume.

#### WHAT HAVE YOU FOR HEALTH EDUCATION HEADQUARTERS AT ATLANTIC CITY?

All health agencies are invited to send their health education and publicity materials to the National Publicity Council for possible inclusion in the portfolios now being prepared for display at the 75th Annual Meeting. The materials will be exhibited in the Health Education and Publicity Headquarters

Arlington, Va., Chief, Natality and General Demographic Analysis Section, National Office of Vital Statistics

Rosanna Morris, B.A., 1700 Broadway, San Francisco, Calif., Senior Public Health Analyst, State Dept. of Public Health

Daniel I. Rosen, A.B., 3415-38th St., N.W., Rm. 208-1, Washington 16, D. C., Chief, Medical Administrative Statistics Division, Department of Medicine and Surgery, Veterans Administration

Beth M. Siegel, B.A., 1396-34th Ave., San Francisco, Calif., Senior Public Health Analyst, State Dept. of Public Health

Candace Thoman B.S., State Department of Health, Lansing 4, Mich., Nosologist

#### *Engineering Section*

Ernest P. Hays, Box 1046, Beeville, Tex., Sanitarian, Bee County Health Unit

Homer J. Hayward, B.S.E., 530 West First St., Delphos, Ohio, Asst. Chief Engineer, Institute of Inter-American Affairs

J. R. Hurtado, Instituto Nacional de Obras Sanitarias, Caracas, Venezuela, S. A., Director of Water Laboratory

Herminio Irizarry, B.S.Ch.E., Guaynabo, Puerto Rico, Chief, Supt., San Juan Filtration Plant

William W. Joy, B.S.C.E., 521 North Butler, Lansing, Mich., Asst. Engineer, State Dept. of Health

Frank A. McCown, 120 Blair St., Anderson, S. C., District Sanitarian, State Board of Health

Arnold S. Nesheim, M.S., Fontanelle, Iowa, Sanitary Engineer, U. S. Indian Service

Emilio Pacheco-Ruiz, M.S., Box 4382, Santurce, P. R., Sanitation Officer, Health Dept.

John H. Pomeroy, B.S.C.E., City Hall, Kalamazoo, Mich., Public Health Engineer, Kalamazoo City-County Health Dept.

Joseph J. Stubbs, Ph.D., Camp Detrick, Frederick Md., Biochemist, Research and Development Dept.

Meradith H. Thompson, Dr.Eng., Rensselaer County Department of Health, Troy, N. Y., Director, Division of Environmental Sanitation

William C. Winn, County Health Department, Spartanburg, S. C., Junior Sanitarian

#### *Industrial Hygiene Section*

N. A. Towne, M.D., 297 Church St., Naugatuck, Conn., Plant Physician, Footwear Plant, U. S. Rubber Co.

Paul Windsor, 2300 No. Adams St., Peoria, Ill., Safety and Medical Manager, R. G. LeTourneau, Inc.

#### *Food and Nutrition Section*

Lillian J. Emoff, 1860 N. Commonwealth, Los Angeles 27, Calif., Consulting Dietitian

Catherine M. Leamy, M.S., 11 W. 42nd St., Rm. 2362, New York, N. Y., Regional Nutrition Consultant, Children's Bureau

Louis M. Lott, 12 No. 360, Vedado, Havana, Cuba, Asst. Professor of Biochemistry, Havana Univ.

Isidore Silverman, B.A., 305 Linden Boulevard, Brooklyn 26, N. Y., Health Inspector, New York City Dept. of Health

#### *Maternal and Child Health Section*

Hilda M. Bolden, M.D., U.S.P.H.S., APO 194, Roberts Field, c/o Postmaster, New York, N. Y., Senior Asst. Surgeon (R), U. S. Public Health Service

Verna S. Carlisle, M.S., 70 E. Elm St., Chicago 11, Ill., Child Development Consultant, Cerebral Palsy Division, National Society for Crippled Children

Donald R. Caziarc, M.A., 407 Vidal Drive, San Francisco 12, Calif., Hearing Conservation Specialist, State Dept. of Public Health

Clara J. Fleischer, M.D., City Health Department, Richmond, Va., Director of Maternal and Child Health

Victoria Gautier, R.N., C. St. No. 23, Bda. Morel Campos, Pence, P. R., Nurse-Midwife Supervisor, Bureau of Maternal and Infant Hygiene, Dept. of Health

Paula Moreno-Herrera, 364 Ave. Andrades, Santurce, P. R., Nurse-Midwife Supervisor, Bureau of Maternal and Infant Hygiene, Dept. of Health

Buenaventura Nuila, M.D., Cojetepeque, El Salvador, C. A., Student, Harvard School of Public Health

#### *Public Health Education Section*

Robert A. Benson, M.D., 180 Wellington St., Ottawa, Ont., Canada, Asst. Health and Welfare Division, Metropolitan Life Insurance Co.

Charles H. Brásuell, B.A., 412 Dauphin Bldg., Harrisburg, Pa., State Representative, National Foundation for Infantile Paralysis, Inc.

J. Edgar Caswell, M.A., 7611 Georgia Ave., N.W., Washington 12, D. C., Acting Director, Bureau of Public Health Education, D. C. Health Dept.

Alberta E. Chase, R.N., A.B., 3713 Washington Blvd., St. Louis 8, Mo., Exec. Secy., Missouri Society for Crippled Children

Mrs. Jerome Evanson, Jamestown, N. D., Educational Director, North Dakota Farmers Union

- Vance C. Fleming, 513 So. Mariposa, Apt. 204, Los Angeles 5, Calif., Student, Univ. of California
- Dewilder J. Gregory, 1160 Oakdale, Bldg. 6D, San Francisco 24, Calif., Student, School of Public Health, Univ. of Michigan
- Myrta O. King, M.S.P.H., Box 244, Cayey, P. R., Health Specialist, Farmers Home Administration
- Richard K. Klein, M.A., State Department of Public Instruction, Bismarck, N. D., Director of Secondary Education
- Eleanor Lefson, R.N., M.A., 5413 Morse St., Philadelphia, Pa., Asst. Consultant, Health Division, Council of Social Agencies
- Mildred K. Lindsay, B.S., 1917 North 7th St., Springfield, Ill., Director of Publications, Illinois Tuberculosis Assn.
- Caroline J. Lum, B.S., Box 188, Newark, N. Y., Field Advisor, State Committee on Tuberculosis and Public Health, State Charities Aid Assn.
- Adelaide Morris, M.A., U. S. Public Health Service, Monrovia, Liberia, W. Africa, Asst. Health Education Director, U.S.P.H.S. Mission in Liberia
- Elizabeth M. Moxley, M.Ed., 612 Mack Bldg., Denver, Colo., Health Educator, Arapahoe-Jefferson Health Committee
- Mary J. Neal, A.B., 21 Front St., Santa Cruz, Calif., Health Educator, Santa Cruz County Health Dept.
- Alice I. Porter, 311 Broadway Tower, Enid, Okla., Exec. Secy., Garfield County Tuberculosis Assn.
- Norbert Reinstein, 520 West 163 St., New York 32, N. Y., Graduate Student, School of Public Health, Univ. of Minnesota
- Kyle C. Rigsby, B.S., Madison County Health Dept., Huntsville, Ala., Health Education Director
- Nancy K. Van Meter, B.S., 1412 South Second St., Springfield, Ill., Director of Seal Sale, Illinois Tuberculosis Assn.
- Monrovia, Liberia, W. Africa, Asst. Nurse Officer (R)
- Cynthia A. Dauch, M.A., Dept. of Public Health Nursing, Univ. of Calif., Los Angeles 24, Calif., Asst. Professor of Public Health Nursing
- Hannah E. Dutter, R.N., West Side Visiting Nurse Assn., Kingston, Pa., Exec. Director
- Mary Flanigan, 522 Hayes Ave., South Beloit, Ill., Supervisor, Visiting Nurse Assn.
- Hazel H. Fowler, B.S., 211 N. University St., Murfreesboro, Tenn., Senior Staff Nurse, Rutherford County Health Dept.
- Ida E. Gutschke, R.N., Kingsbard Apts., Springfield, Mo., Public Health Nurse, State Dept. of Health
- Mary E. Ingle, R.N., B.S., Box 710, Raleigh, N. C., Area Supervising Nurse, Migratory Labor Health Assn.
- Anne K. Knight, 612 Main Ave. S., Twin Falls, Idaho, Staff Nurse, State Dept. of Health
- Elizabeth Koester, R.N., B.S., Box 869, Billings, Mont., Area Supervising Nurse, Agricultural Workers Health Assn.
- Frieda M. Lohofener, R.N., B.S., 201 W. Oak St., Sparta, Wis., Advisory Public Health Nurse, State Board of Health
- Ruby McKenzie, Court House, Port Washington, Wis., Ozaukee County Public Health Nurse
- Soledad M. Montano, 3815 Walnut St., Philadelphia, Pa., Nursing Student, Univ. of Pennsylvania
- Mary Pauli, 91 Judson, Pontiac 20, Mich., Director, Nurse Service, Visiting Nurse Assn.
- Madeline Pershing, R.N., M.A., 23 E. Charlton St., Savannah, Ga., Nurse Training Officer, U. S. Public Health Service Field Training Station
- Betty R. Ranson, 431 Hampton Rd., West Palm Beach, Fla., Area Supervising Nurse, Migratory Labor Health Assn.
- Veronica F. Richeimer, M.A., P. O. Box 229, Columbus, Ga., Director of Public Health Nursing Service, Columbus-Muscogee County Health Dept.
- Martha S. Rossell, R.N., Foley, Fla., Public Health Nurse, Taylor County Health Dept.
- Florence B. Schrieber, R.N., B.S., 532 Carplin Place, Cincinnati 29, Ohio, Supervising Public Health Nurse, City Health Dept.
- Lydia Schuleman, R.N., 3219 Lake Ave., Wilmette, Ill., Staff Nurse, Chicago and Cook County Tuberculosis Institute
- Rachel K. Sherwin, West Market St., Georgetown, Del., Public Health Nursing Supervisor, State Board of Health
- Mabel A. Taylor, R.N., Court House, Newton,

#### *Public Health Nursing Section*

- Mary A. Anderson, 1 Parley Vale, Jamaica Plains, Mass., Senior Public Health Nurse, Chenango County (N. Y.) Board of Supervisors
- Phoebe Anderson, B.S., 315 N. Niles St., Paw Paw, Mich., Supervisor of Public Health Nurses, Van Buren County Health Dept.
- Hazel Birch, B.S., U. S. Public Health Service, Monrovia, Liberia, W. Africa, Asst. Nurse Officer (R)
- Zyra Brannen, Foley, Fla., Public Health Nurse, State Board of Health
- Theresa Colwell, U. S. Public Health Service,



Kans., Public Health Nurse, Harvey County Health Dept.  
 Martha B. Waltmire, R.N., 420-6th Ave. North, Nashville, Tenn., Public Health Nursing Consultant, State Dept. of Public Health  
 Helen V. Wright, M.A., City-County Health Unit, Boise, Idaho, Supervising Nurse

#### *Epidemiology Section*

Carlos Carboney-Mora, M.D., 148 Calle Guerrero, Mexico City, D. F., Mexico, Epidemiologist, Division of States and Territories, Mexican Ministry of Public Health and Welfare  
 Albert E. Casey, M.D., 1907 Wellington Rd., Birmingham 9, Ala., Scientific Director, Poliomyelitis Survey, Chicago  
 Guy S. Hayes, Rockefeller Foundation, 49 W. 49 St., New York, N. Y., Student, Johns Hopkins School of Hygiene and Public Health  
 Lt. Lloyd F. Miller, M.C., USN, Bureau of Personnel, U. S. Navy, Washington, D. C., Student, John Hopkins School of Hygiene and Public Health  
 Lt. Col. Gottlieb L. Orth, M.C., 108 Art Rd., Fort Sam Houston, Tex., Director, Dept. of Preventive Medicine, Medical Field Service School, Brooke Army Medical Center  
 Col. Thomas E. Patton, Jr., M.C., Medical Section, Hq. Fourth Army, Fort Sam Houston, Tex., Chief of Preventive Medicine  
 Charles L. Staples, B.S., 1900 Prairie Ave., Chicago 16, Ill., Managing Editor, Domestic Engineering Magazine  
 Durval Guimaraes-Tinoco, M.D., M.P.H., Servico Especial de Saude Publica, Belem, Para, Brazil, Health Officer  
 Ahmed Z. Zaghoul, M.B., Mir Kibly, Asint Province, Egypt, Medical Officer

#### *School Health*

Mary C. Benbow, Sharon Senior High School, Sharon, Pa., School Nurse  
 Frances R. Horwich, Ph.D., Roosevelt College,

231 S. Wells St., Chicago, Ill., Professor of Elementary Education  
 Beryl M. Phares, B.S., Board of Education, Dallas 1, Tex., Director of School Nurses  
 Hilda Schumacher, 1417 E. First St., Duluth, Minn., Health Supervisor, Duluth State Teachers College

#### *Dental Health Section*

John C. Bergmann, D.D.S., M.Sc., 5202 Foster Ave., Chicago 30, Ill., Chief, Bureau of Child Welfare, Chicago Health Dept.  
 Margaret E. Cunningham, B.A. Box 155, 411 W. 116 St., New York 27, N. Y., Student in Dental Hygiene, Columbia Univ.  
 Manfred I. Kalland, D.M.D., 514 Olympic Place, Seattle, Wash., Asst. Director of Dental Affairs, War Dept.  
 Dorothy H. Young, D.D.S., 1667 - 9th Ave., San Francisco 22, Calif., Chairman, Section on Dentistry for Children, Univ. of California

#### *Unaffiliated*

Samuel C. Bloom, D.V.M., 6341 Broadway, Chicago 40, Ill., Veterinarian  
 Morrill B. Donald, M.A., 1132 W. Grace St., Richmond 20, Va., Personnel Administration Advisor, U. S. Public Health Service  
 Margaret A. Gray, B.S., 2600 E. 12th St., Los Angeles 23, Calif., Home Economist, Lily Tulip Cup Corp.  
 H. H. Marble, 2510 Travis, Houston, Tex., Exec. Secy., Associated Master Plumbers of Houston  
 Lester A. Meis, B.A., 741 Gayley Ave., Los Angeles 24, Calif., Student, Univ. of California  
 Vernard E. Sherman, R1 Glendale, Las Crosse, Wis., Hotel and Restaurant Inspector, State Board of Health  
 Lois Stice, A.B., 2 East 103 St., New York, N. Y., Member of Staff, Committee on Public Health Relations, New York Academy of Medicine  
 Clifton J. Woods, Jr., B.S., 4326 Prairie Ave., Chicago 15, Ill., Student, Univ. of Illinois

#### CLOSING DATE FOR SUBMISSION OF FELLOWSHIP APPLICATIONS

August 1 will be the last date on which Fellowship applications can be accepted for consideration at the 1947

Annual Meeting in Atlantic City. Eligible members who wish to apply for Fellowship this year are therefore urged to send in their applications as early as possible.

## EMPLOYMENT SERVICE

The following pages present information for those seeking qualified public health personnel and for those seeking positions in public health.

This is a service of the Association conducted without expense to the employer or employee.

Address all correspondence to the Employment Service, A.P.H.A., 1790 Broadway, New York 19, N. Y., unless otherwise specified.

### POSITIONS AVAILABLE

(Supplemental to list in June Journal)

**Staff School Nurse** for small, but old and well organized school health department in scenic spot on Pacific Coast. Salary approximately \$2,700, 35 hour week, 9 calendar months, including 2 weeks vacation Christmas, one week Easter. Three summer months free for vacation, study or work. Annual increment for ten years, tenure after three probationary years. Must be under thirty-five, with B.A. and P.H.N. degrees, at least one year's experience in generalized nursing program. When applying send photograph of self, age, degrees, training and experience since receiving P.H.N., marital status, number of children. Position open September, 1947. Write Box N-390, Employment Service, A.P.H.A.

**Supervising Public Health Nurse** in Municipal Health Department, with four years' experience in PHN. Must have eligibility for Wisconsin registration as a graduate nurse; two semesters' study in PHN; and a bachelor's degree. Beginning salary \$227 month, plus car allowance. Applications will be accepted until the needs of the service are filled. Write Personnel Department, City Hall, Madison 3. Wis.

**Sanitary Engineer** with experience and training; particularly in sewerage work. Salary range \$270 to \$350 per month depending on experience. Write to J. B. Harrington, Director, Division of Sanitary Engineering, State Department of Health, Charleston, W. Va.

**Public Health Physician** to do communicable disease control work, well child examinations, and be assistant to the director of public health. The communicable disease control work includes epidemiological investigations, the supervision of a tuberculosis x-ray program, and the conduct of venereal disease clinics. Full-time position in a staff of fifty employees. Salary. \$5,400 to \$6,600 plus travel ex-

pense. Write C. R. Fargher, M.D., Director of Public Health, City Hall, Tacoma, Wash.

**Medical Social Worker**, Montgomery County, Maryland (adjacent to District of Columbia). Completion of approved medical-social work curriculum and one year paid, full-time experience under supervision in hospital or clinic of acceptable standards essential. Beginning, \$3,000 to \$3,600. Write V. L. Ellicott, M.D., Health Officer, Rockville, Md.

**Public Health Nurses:** Baltimore County Health Department. Population 230,000; urban, suburban, and industrialized areas; county seat 8 miles from Baltimore. Generalized service; director, 3 supervisors, 22 field nurses. Immediate large expansion planned. Beginning salary \$2,000 (for trainee) to \$2,500, depending on experience and education. Retirement plan; one month's vacation; 5 day, 35½ hour week; sick leave. For use of personal car, allowance of 7 cents per mile. Write to Dr. William H. F. Warthen, Health Officer, Baltimore County Health Department, Towson 4, Md.

**Physician** for combined position: Assistant Physician, Fall River Tuberculosis Hospital and Admitting Officer at Out Patient Department, Fall River General Hospital. Salary \$1,400 annually plus maintenance. Write Arthur L. Ledoux, M.D., Commissioner, Fall River Board of Health, Fall River, Mass.

**School Nurse:** Trained in public health, for city near Detroit. Population 18,000, enrollment 3,000. Salary for first year approximately \$2,800. Write Box N-392, Employment Service, A.P.H.A.

**Public Health Nursing Supervisor** in county of 35,000—100 miles west of Chicago. Must have college degree and public health training. Salary \$250

monthly, plus \$60 travel allowance. Write Box N-394, Employment Service, A.P.H.A.

**Physicians, Male.** For school health service and medical care of low income families. Five days per week (40 hours). Salary \$347 monthly, plus automobile allowance \$30. Retirement features. Cincinnati Health Department. City Hall, Cincinnati 2, Ohio.

**Public Health Staff Nurse, Hillsdale County Health Department, Southern Michigan.** Well established health department with student field training program. Requirements: public health nursing certificate and college degree. Write to Dr. F. G. Moench, Director, County Health Department, Hillsdale, Mich.

**Health Commissioner** for combined health district, Ohio, serving population of approximately 40,000. Staff of twelve, adequate budget, established health department (23 years). Salary depends on training and experience. Write Box H-2, Employment Service, A.P.H.A.

**Tuberculosis Medical Consultant:** Qualifications: M.D. from approved school, internship, two years' medical experience (one year in a tuberculosis hospital, sanatorium or clinic). Salary range: \$5,520-\$6,540 plus traveling expenses. Write Mr. R. B. Beaumier, Administrative Officer, Washington State Department of Health, Smith Tower, Seattle 4, Wash.

**Health Officers and Physicians wanted:** Pinellas County (St. Petersburg, Clearwater), man with public health experience, training, beginning salary \$7,200; Leon County (Tallahassee), beginning salary \$6,000; several counties open shortly. Younger men preferred; persons must be below 45 when entering public health for first time. Also tuberculosis and venereal disease clinicians, psychiatrists, general medical men needed for State Board of Health, County Health Units and State institutions. Beginning salaries range from \$5,000 to \$6,000. Younger men preferred. Write or wire Supervisor, Florida Merit System, P. O. Box 1136, Tallahassee, Fla.

**Chief of Division of Maternal and Child Health** in new industrial community. Salary \$6,000 plus car for official business. Forty-four hour week, annual and sick leave. Housing available at reasonable cost. Write Box G-2, Employment Service, A.P.H.A.

**Health Officer, Midwestern City** of approximately 75,000. Should have training in public health work or be willing to take

such training. For information write to Box F-2, Employment Service, A.P.H.A.

**Trained and experienced Health Officer** for new Quadri-County Health Department; population 41,000; Midwest; mostly agricultural. Salary \$7,200 plus travel. Write Box E-2, Employment Service, A.P.H.A.

**Public Health Nurse** to inaugurate a visiting nursing service for the Santa Maria Valley Chapter of the American Red Cross. Experienced person desired. Minimum salary \$3,000. Car furnished. Write qualifications to Mrs. Chester M. Langenbeck, 602 E. Main Street, Santa Maria, Calif.

**Public Health Nurse** for tuberculin testing demonstrations—a lend-lease project with county tuberculosis associations. Nurse to give and read Mantoux tests, be capable of supervising or conducting pre-educational work and community organization. Must have car. Salary \$3,000 to \$3,600 annually, plus living and travel expenses. Write Box D-2, Employment Service, A.P.H.A.

**City Health Officer** to serve industrial city of 20,000 population on full-time basis; opportunity to develop school medical and child health services in coöperation with community agencies. Reply in detail to Board of Health, City Hall, North Adams, Mass.

**Physician experienced in tuberculosis** for position of Assistant Director of Tuberculosis Control in city-county health department of midwest community; \$4,500 with full maintenance. Write Box A-3, Employment Service, A.P.H.A.

**Supervising Public Health Nurse:** in Marin County Health Department for an expected vacancy. California registration and P.H.N. Certificate required; qualifications comparable to either those of the California State Health Department or preferably to those of the A.P.H.A. Generalized program with six staff nurses in semi-rural county immediately north of San Francisco. Mileage supplied on private car at 8¢ per mile. Expected starting salary \$250. Write Miss Elizabeth Newell, Supervising Nurse, Marin County Health Department, 704-4th Street, San Rafael, Calif.

**Director of Public Health Nurses:** same agencies and comparable qualifications; a new position expected to be created at \$300 per month beginning salary. Write: Irving D. Johnson, M.D., Marin County Health Officer, Marin County Health Department, 704-4th Street, San Rafael, Calif.

**Public Health Commissioner** in Tuscarawas County, New Philadelphia, Ohio. Must have degree in Public Health. To serve in a county with a population of approximately 40,000. Beginning salary \$6,000 or more. Write Box C-2, Employment Service, A.P.H.A.

**Health Officer:** salary \$6,000. Requirements: Graduation from medical school of recognized standing, three years' practice of medicine, graduate of recognized school of public health with at least one year's attendance. Full-time position. City of 27,000. Apply Board of Health, Middletown, Conn.

**Public Health Engineering Laboratory** in Central States region has opening for **Sewage and Wastes graduate chemist**, 3 years' experience expected, preferably in similar laboratory work. Position requires some field investigations. Salary range \$230-\$290. Write Box B-2, Employment Service, A.P.H.A.

**Public Health Nurses.** (1) Two positions for experienced nurses (beginning salary \$2,400, must furnish automobiles, mileage allowance). (2) Two junior grade positions, (beginning salary \$2,100, mileage allowance). Full-time health unit including six counties in picturesque rural Badlands area. Generalized program. Write Mary E. Soules, M.D., District Health Officer, Southwestern Health Unit, New England, N. D.

**Associate Bacteriologist**, College degree, one year training in public health laboratory, two years' experience. Five day week. Salary \$2,750. Write William A. Dorsey, Laboratory Director, Arlington County Laboratory, P. O. Box 151, Arlington, Va.

**Sanitary Chemist or Engineer** for staff position in engineering school, southeast. To do research work (methods of water and sewage analysis) which can be applied toward advanced degree; also will have to carry some undergraduate teaching. Write Box E-512, Employment Service, A.P.H.A.

**Superintendent of Nurses** for 130 bed tuberculosis sanatorium in Illinois. Institution has staff of eighteen nurses, average daily patient count 120. Attractive living quarters, good working conditions. Position permanent. Salary open. Write Box N-396, Employment Service, A.P.H.A.

**Health Officers (M.D.)** for several important city-county and other local health department openings in West Virginia. Some of the positions carry teaching re-

sponsibilities, implementing the basic salary of \$6,000. Physicians are encouraged to apply even if lacking public health training or experience; must be below 35 years at first public health appointment. Write Bureau of County Health Work, West Virginia Dept. of Health, Charleston, W. Va.

**Specialized Consultant Nurses** in the following programs—Tuberculosis, Maternal and Child Health, School Health Service. Requirements include bachelors degree with major in public health nursing, advanced preparation in the specialty and one year of experience in generalized supervision. Travel allowance. Salary open. Write Director, Division of Public Health Nursing, State Board of Health, Jackson, Miss.

**Negro M.D.—Assistant Director School Health Service** in Nashville, Tenn. Public Health experience desirable but not absolutely necessary. Staff of three doctors and twelve nurses doing broad school health program in metropolitan area. Chance to affiliate with Meharry Medical School. Salary open, 12 months. Eligible for Civil Service if under 40. Communicate Director School Health Service, Nashville, Tenn.

**Health Officer** wanted, September through June to substitute while on educational leave. Illinois County of 35,000, 100 miles from Chicago. Salary \$515 per month plus \$60 month's travel. Two weeks sick leave and three week vacation leave provided, annually. Lee County Health Department, 123 East First Street, Dixon, Ill.

Experienced, trained man for **Public Health Executive** position in San Mateo County, California. Starting salary \$7,788 per year, increasing annually over four years to \$9,732. Write Civil Service Commission, Courthouse, Redwood City, Calif.

**Industrial Hygiene Chemist**, five years' experience. Graduate of accredited college with major in chemistry. Salary \$325-\$425 per month, plus travel expenses. State Civil Service position with vacation, sick leave, and retirement privileges. Send brief outline with request for application form to State Health Officer, Louisiana State Department of Health, New Orleans 7, La.

**Public Health Nurses** in official generalized program of Washtenaw County, Michigan, at Ann Arbor. Agency is field teaching center for University of Michigan. Opportunity to study at University.

Beginning salary \$2,700; \$600 travel allowance. Write for details to Nursing Director, 720 E. Catherine Street, Ann Arbor, Mich.

Director of Public Health Nursing for Columbia County Dept. of Health. Apply: Columbia County Dept. of Health, 612 Warren Street, Hudson, N. Y.

### POSITIONS WANTED

**Dentist:** 1942 graduate, Veteran, experienced in general and children's dentistry; postgraduate course in Full Denture Prosthesis and General Anesthesia, desires a position with a municipal, county, or state health department or school system. Write Box A-2, Employment Service, A.P.H.A.

**Veterinarian:** Age 25 years; B.S., D.V.M., seeks field or laboratory position. Major interest investigation and/or control of animal diseases communicable to man. Experience, UNRRA Agricultural Rehabilitation, university Histology laboratory, city health department diagnostic laboratory. Write Box L-525, Employment Service, A.P.H.A.

**Engineer,** M.S. degree in sanitary engineering, veteran, age 28, desires position in Eastern United States; 5 years' experience in official agency; armed forces, and industry. Write Box E-510, Employment Service, A.P.H.A.

**Graduate Social Worker.** Degree in Community Organization. Experience: public relations and interpretation for health agency; intake worker. Committee work. Some case work with patients; also health education. Good at programming. Negro. Write Box M-502, Employment Service, A.P.H.A.

**Health Educator, M.P.H.,** woman, seeks position with voluntary or official agency. Some field experience. Midwest preferred but other regions considered. Write Box H-536, Employment Service, A.P.H.A.

**Health Agency Executive** desires position as Director of Health Council or Voluntary Agency. Excellent experience in health interpretation. Community organization and, coordination. Wishes permanent residence West Coast or Southwest. Write Box A-527, Employment Service, A.P.H.A.

**Bacteriologist, Ph.D.,** 29, Yale. Academic, industrial and medical research experience. Background in biochemistry, immunology and parasitology. In charge of U. S. Government laboratories, food and water control, health programs (malaria, etc.), mass immunization, etc., in several foreign countries (including tropics) during war years. Training in statistics, pharmacology, pathology. Write Box L-531, Employment Service, A.P.H.A.

**Former Sanitary Engineer (RC)** Public Health Service, long experience, now employed, desires position sanitary engineer or director sanitation with municipal or local health unit. Write Box E-514, Employment Service, A.P.H.A.

### Advertisement

## Opportunities Available

WANTED—(a) Director; city-county department; capital of middle western, state, home of state university; active community support; expanding program; \$6,000–\$7,200, traveling expenses. (b) Young woman physician and, also, young man for student health appointments; training in internal medicine desirable; present staff consists of 10 full-time physicians, 60 part-time physicians; opportunity of attending clinics and seminars at university medical school; nine month appointments with period of additional six weeks during summer session. (c) Chief of division of maternal and child hygiene; industrial town of 45,000; new home available at reasonable cost; major emphasis of child hygiene program on school child; \$6,000 including car. (d) Medical officer; master's degree in public health and some experience, preferably in rural health programs; key position requiring administrative ability; \$7,200, Latin America. (e) Student health physician; hours 9 to 3; duties include some teaching; Chicago area. PH7-1 Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago 11.

WANTED—(a) Health educator; county health program; New England. (b) Industrial hygiene chemist; large industrial company; West. (c) Young man to take charge of public health work and bacteriology; liberal arts college; duties include teaching hygiene, public health and training sanitarians. (d) Health educator; coordinating health agency long

established in central metropolis. (e) Health educator; newly created position, municipal health department, middle western town of 150,000; salary dependent upon qualifications, minimum \$3,600. PH7-2 Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago 11.

WANTED—(a) Industrial nurse consultant; public health nurse with industrial nursing experience preferred; large insurance company; considerable traveling. (b) Public health nurse; training provided if nurse wishes career in public health; university town, California; \$200–\$255 dependent upon qualifications. (c) Supervising nurse; city health department, United States dependency; must be qualified to organize nursing program. (d) Public health nurse to supervise newly constructed outpatient department; Hawaii. (e) Director of nurses, supervisor and field nurses; national organization having generalized program; considerable traveling; salaries for director and supervisor, \$4,100; for field nurses, \$3,390. (f) Public health nurse to head visiting nurse association recently established; competent organizer required; Chicago area; \$2,700. (g) Director of nurses and general supervisor; public health association; generalized program; considerable traveling; administrative experience required; salaries, \$4,149 per annum; Northeast. PH7-3 Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago 11.

### Advertisement

## Opportunities Wanted

Public health physician is available for administrative appointment; Ph.B. degree and Doctor of Medicine degree, Eastern university; M.S. degree in Public Health Medicine; seven years' public health work which has been largely administrative; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Health educator; B.S., M.S. and Ph.D. degrees; several years, instructor in biology, bacteriology and health; state university; three years, public health educator, city and county health department; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Public health nurse is available for administrative position in public health, Bachelor of Science in Education with major in Public Health nursing; past several years, supervisor public health staff, important war project; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Sanitary engineer is available for public health appointment; C.E., Eastern university; two years' municipal engineering including supervision of field personnel; six years, sanitary engineer with state department of health where he has obtained broad experience in all phases of environmental sanitation; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

## NEWS FROM THE FIELD

### WORLD HEALTH ORGANIZATION

July 22 will mark the first full year since the establishment of the World Health Organization. On July 22, 1946, 61 nations met in New York to sign the Constitution and establish the World Health Organization as a specialized agency of the United Nations.

An Interim Commission was established to carry on the health duties pending the ratification of the Constitution by 26 members of the United Nations. In the past year ratifications have not been as rapid as many had expected. By June 1 only nine members of UN (and three non-members) had ratified the document. Unfortunately these did not include the United States. Although Secretary of State George C. Marshall had placed the ratification of the WHO Constitution high on his priority list for foreign affairs this spring, by June 1 the matter had not come before either the Senate or the House for formal action. It is reported that no objection to approval of the Constitution exists, but that pressure of emergency foreign affairs has prevented the proposition from reaching the calendar.

In the past year considerable progress has been made in the international health field through continuing health programs and new projects instituted by WHO. The health programs of the League of Nations, UNRRA, and the Office International d'Hygiène Publique were taken over. This involved continuing the world-wide work in epidemiological reporting with issuance in French and English of *The Weekly Epidemiological Record* and transmission of notifications by letter, cable, and radio. The Singapore Epidemiological Station was taken over on April 1 with

facilities for broadcasting data to the Far East via several radio stations.

Biological standardization work has been continued, and on June 9 a meeting of the Expert Committee on Biological Standardization was held in Geneva.

The Interim Commission is now sponsoring health programs in Greece, Ethiopia, and China, as well as an international fellowship program, all previously carried by UNRRA. DDT spraying from airplanes and house spraying are proving effective in bringing malaria under control in Greece. WHO experts are coöperating with Greek health officials in efforts to reduce the incidence of tuberculosis.

Some 34 technical health people are working in coöperation with official Chinese agencies to train medical, dental, health, and nursing personnel.

An expert team is being sent into Yugoslavia to train personnel in plastic surgery.

More than 200 fellowships are being granted in 1947. Only countries which received UNRRA aid are eligible to appoint fellows. Ten per cent of the fellowships have been allocated to work in pediatrics and child health.

The WHO during its first year instituted a promising program of expert committees. Three committees had already met by June 1. The Expert Committee for the Preparation of the Sixth Decennial Revision of the *International Lists of Diseases and Causes of Death* met in Ottawa March 10-19 and prepared an extensive report of recommendations. The Expert Sub-Committee for the Revision of the Pilgrimage Clauses of the International Sanitary Conventions made a field study in the Red Sea area April 16-24, and the Ex-

pert Committee on Malaria met in Geneva April 21-26.

Other expert groups appointed include those on quarantine, yellow fever, habit-forming drugs, revision of conventions, and tuberculosis.

Of particular interest to public health workers is the program of technical publications approved at the third session of the Interim Commission in April, 1947. A monthly *Chronicle of the World Health Organization Interim Commission* will be published in English, French, Spanish, Chinese, and Russian. For 1947 two issues of the *Bulletin of the World Health Organization—Interim Commission* and two issues of the *Digest of Health Legislation* were approved.

#### PROPOSED FEDERAL PROGRAM ON CIRCULATORY DISEASES

On February 26 Senator Claude Pepper of Florida introduced a Bill (S.720) which has been referred to the Committee on Labor and Public Welfare, authorizing and requesting the President to undertake to mobilize at some convenient place or places in the United States an adequate number of the world's outstanding experts and to coördinate and utilize their services "in a supreme endeavor to discover new means of treating, curing, and preventing diseases of the heart and arteries."

The Bill briefly authorizes the President to undertake "in whatever manner he may deem most appropriate" to bring together outstanding experts from any country and to coördinate their services "through the Surgeon General of the United States," or through an independent group appointed by him." The President is also authorized to build needed clinical laboratory research facilities in order adequately to approach this problem, which, according to the Bill, involves the death of more than 587,000 persons a year in the United States and which causes dis-

ability to more than 7 million persons.

The Bill authorizes the sum of \$100,000,000 to be appropriated for these purposes.

#### DR. GODFREY RETIRES AS NEW YORK STATE COMMISSIONER OF HEALTH

On May 1, 1947, Edward S. Godfrey, M.D., retired as New York State Commissioner of Health after having served 30 years in the department, 11 of them as State Commissioner. He first joined the staff of the New York State Health Department in 1917 as epidemiologist. In 1936, he was appointed State Commissioner by Governor Lehman to succeed Thomas Parran, M.D., and was twice reappointed by Governor Dewey in 1944 and 1947.

After his graduation from the Virginia Medical School in 1903, Dr. Godfrey was in Arizona for 13 years, 4 of them as superintendent of public health of the Territory of Arizona and the remainder in private practice. In 1916 he became epidemiologist on the staff of the Illinois State Board of Health, and a year later was appointed epidemiologist of the New York State Department of Health. His service to New York State has been continuous since that date except for a period during World War I.

In 1920, Dr. Godfrey was appointed Director of the Division of Communicable Diseases of the State Health Department and later assistant Commissioner in charge of local health administration. During this period he developed practical methods of reducing mortality from measles and diphtheria, instituted a systematic control of typhoid carriers, reorganized the work of the 16 state health districts, and had general oversight of the work of some 800 local health officers. He has been recognized particularly for his work in communicable diseases and for his improvement of district public health services.



In 40 years of public health work, Dr. Godfrey has been associated in many important developments. He has contributed scientific articles to the literature on public health, notably reports on studies of measles in children's institutions and on the epidemiology of measles and of diphtheria. He is the author of the chapter on Epidemiology in Park's *Hygiene and Public Health*.

Dr. Godfrey is a founder and past-president of the American Epidemiological Society, a Fellow of the New York Academy of Medicine, the American Medical Association, and the American Public Health Association. He was President of this Association in 1939-1940 and has been active in its affairs for many years. Currently he is Chairman of the Committee on Constitution and By-Laws and is a member of the Committee on Professional Education.

#### DR. SABIN FIRST WINNER OF JANE ADDAMS MEDAL

Rockford College (Ill.) recently celebrated its 100th anniversary. As a part of the centenary services, it awarded the Jane Addams Medal for distinguished service by an American woman to Florence Rena Sabin, M.D., of Denver in recognition of her "untiring achievements" in public health work in Colorado. Dr. Sabin is the first winner of this newly established award.

#### SOUTHERN BRANCH ANNUAL MEETING

The Southern Branch of the American Public Health Association met in Memphis, April 21-23, with 3 general and 8 section meetings. Carl Buck, Dr.P.H., Field Director of the Association addressed the Health Officers Section on The Next Important Steps in Public Health; William T. Ingram, Engineering Field Associate, participated in the program of the Sanitation Officers Section on discussing the Technique of Evaluation of a Sanitation Program of a Local Health Unit; and

Charles B. Frasher, Merit System Field Associate, spoke before a joint session of five sections on Merit Systems.

Officers for the coming year were elected as follows:

*President*—John W. Williams, Jr., M.D.  
*First Vice-President*—G. S. T. Peeples, M.D.  
*Second Vice-President*—O. C. Hopkins  
*Secretary-Treasurer*—John W. Whitney, M.D.  
*Representative on Governing Council*—Robert H. Riley, M.D.

All except the last mentioned have served during the past year and were reelected for a term of another year.

#### ALMROTH WRIGHT, TYPHOID HERO, DIES

Sir Almroth Edward Wright, the introducer of antityphoid inoculation, died in London on April 30. He was 85 years old.

The famous bacteriologist had been credited with saving more than 100,000 lives of British soldiers in World War I through his use of typhoid inoculations. He also did much valuable work in the preparation of other vaccines, such as those for tuberculosis and pneumonia.

Sir Almroth was head of the Institute of Pathology at St. Mary's Hospital in London from 1902 until his retirement in June, 1946. His assistant and colleague for many years was Sir Alexander Fleming, the discoverer of penicillin.

#### COMMONWEALTH FUND APPOINTS NEW DIRECTOR

Donal Sheehan, M.D., has been appointed General Director of the Commonwealth Fund. He will take office on September 1, the effective date of the retirement of the present director, Barry C. Smith. Dr. Sheehan is professor of anatomy of the New York University College of Medicine.

Dr. Sheehan, born in England forty years ago, was educated at the University of Manchester. After postgraduate study at Vienna, Breslau, and Amsterdam, and at McGill and Yale, and two

years' teaching of neuro-anatomy at Manchester, he joined the medical faculty of New York University in 1937. As acting dean of the College of Medicine during the war he was a leader in planning the reconstruction of its medical curriculum and in preparing a program for its development which, according to Dr. Harry Woodburn Chase, chancellor of the university, contains "what is most vital in present-day medical thinking."

Dr. Sheehan is a trustee of the Josiah Macy, Jr., Foundation and recently completed a mission in Czechoslovakia for the Rockefeller Foundation.

#### NEW MEXICO PUBLIC HEALTH ASSOCIATION

At its Annual Business Meeting held on May 21 in Albuquerque, the New Mexico Public Health Association elected the following new officers:

*President:* C. E. Kaufman, M.D., Silver City  
*President-elect:* Mrs. Eunice L. Vandervoort, Santa Fe  
*Vice-President:* Mrs. Gerald Hein, Clovis

Dr. James R. Scott is the representative of the New Mexico society on the A.P.H.A. Governing Council. The Secretary-Treasurer is Leon du Flon of Albuquerque.

#### STATE DIRECTORS OF LOCAL HEALTH SERVICES MEET

The first annual meeting of the newly organized Association of State and Territorial Directors of Local Health Services met in Topeka, Kans., on April 10 and 11. It adopted a Constitution and By-Laws, elected officers, and discussed the problems of local health service—state legislation, 1948 fiscal budgets, local-state relationships, and personnel recruitment and training.

The following officers were elected for the ensuing year:

*President:* Monroe F. Brown, M.D., Director of Local Health Service, Tennessee State Health Department

*1st Vice-President:* John W. Shackelford, M.D., Director of Local Health Service, Oklahoma State Health Department

*2nd Vice-President:* V. A. Van Volkenburgh, M.D., Assistant Commissioner of Health, New York State Health Department

*Secretary:* Richard F. Boyd, M.D., Chief, Division of Local Health Administration, Illinois Department of Public Health

#### *Members of Executive Council:*

George Dame, M.D., Director, Bureau of Local Health Service, Florida State Health Department

J. K. Altland, M.D., Director, Bureau of Local Health Service, Michigan State Health Department

#### DR. FERREE TO NATIONAL HEALTH COUNCIL

John W. Ferree, M.D., on May 1 began his duties as an associate director of the National Health Council. He is engaged principally in helping local, county, and state health councils to broaden the scope of their usefulness, and in stimulating the formation of local health councils wherever they would advance the effectiveness of community and state health agencies.

Dr. Ferree was Indiana State Health Officer between 1940 and 1942, and director of its Bureau of Local Health Administration for four years previously. During the war he served in the U. S. Navy as officer in charge of the Venereal Disease Control Section of the Division of Preventive Medicine, returning in 1945 with the rank of Commander. Since that time he has served on the staff of the American Social Hygiene Association.

#### HEALTH COUNCIL OF GREATER NEW YORK COMPLETES ITS FIRST YEAR

On April 30 the first year's report of the Health Council of Greater New York was made at a meeting in New York. Among its items is a brief history which indicates that the Council was established through the financial aid of the American Red Cross and after a six month survey of the need for such a council. Pledges from this agency

and foundations will make available approximately \$50,000 a year for five years.

Bailey B. Burritt, Co-Chairman of the Long-Range Planning Committee recommended a plan for a broad survey of the city's health needs and facilities and the subsequent development of a master health plan for the city. This will entail weekly hearings, "town meetings for health," when experts will present the needs and when the Council's area of activity and its relationship with other coordinating agencies will be defined.

#### HUMAN RELATIONS QUARTERLY

*Human Relations*, a new quarterly journal has been organized to serve as a channel in which work in the various social sciences may converge for comparative study at an international level. Need for it arises from a growing necessity to integrate the social sciences. It will supplement the more specialized journals by providing side by side comparison of related work in sociology, psychology, economics, anthropology, psychiatry, and other disciplines. It is a project jointly of the Tavistock Institute of Human Relations, London, and the Research Center for Group Dynamics, Massachusetts Institute of Technology, Cambridge, Mass.

The first issue will appear shortly. The annual subscription is \$7.00. Editorial correspondence and contributions should be addressed to Dorwin Cartwright, Chairman, American Editorial Committee.

#### WHO SPONSORS "FACULTY ON WHEELS" TO AUSTRIA AND HUNGARY

The first travelling teaching unit sponsored by the World Health Organization Interim Commission is touring Austria and Hungary during July and August to show advances in medical research and practices on a truly interna-

tional scale. Its members will travel as a group to the various medical centers, lecturing, participating in conferences, and demonstrating new surgical techniques and the use of some of the more recently developed sera and drugs.

In reporting this program, Dr. Brock Chisholm, Executive Secretary of the Interim Commission, said, "Thousands of doctors all over the world have lived behind the curtain of censorship during the war years, working alone and unable to share in the knowledge of their associates in other countries. Only a few will be able to travel to centers of new research. This is why top-ranking specialists in a dozen fields are volunteering for this two month visitation to hospitals, clinics and universities in the two countries."

The American Unitarian Association, which had previously sent similar missions to Poland and Czechoslovakia in 1946 under the sponsorship of UNRRA, is undertaking this mission at the request of the Interim Commission. The ten man team, made up of eight Americans and two Swiss, will include specialists in physiology, pharmacology, cancer research, public health, surgery anesthesia, internal medicine and psychiatry.

The members of this mobile teaching unit are:

Maurice B. Visscher, M.D., Professor and Head of Department of Physiology, University of Minnesota, *Chairman*

Arwin Kohn, Director of Medical Projects, American Unitarian Association, Executive Director

John J. Bittner, Professor and Director of Cancer Research, University of Minnesota

McKeen Cattell, M.D., Professor and Head of Department of Pharmacology, Cornell University College of Medicine

Stuart C. Cullen, M.D., Professor and Chairman of the Division of Anesthesiology, University of Iowa

Joseph P. Evans, M.D., Associate Professor of Surgery, University of Cincinnati College of Medicine

Chester M. Jones, M.D., Clinical Professor of Medicine, Harvard Medical School

S. Bernard Wortis, M.D., Professor and Head

of the Department of Psychiatry, New York University College of Medicine

Eric Martin, M.D., Professor of Medicine and Director of the Medical Polyclinic, University of Geneva

Hermann Mooser, M.D., Professor of Bacteriology and Hygiene, and Director, Institute of Hygiene, University of Zurich

NATIONAL INSTITUTE OF SOCIAL  
SCIENCES MEDAL TO  
KATHARINE LENROOT

Katharine Lenroot, Chief of the U. S. Children's Bureau, was recently awarded the Gold Medal of the National Institute of Social Sciences for distinguished services to humanity. Presented to Miss Lenroot by G. Howland Shaw, former chief, division of foreign service personnel of the State Department, the citation reads as follows:

"As chief of the Children's Bureau, you have with true humanitarian spirit and sympathetic understanding devoted yourself to the welfare of children and child life in America. To the youth of today who will be the men and women of tomorrow, you have brought new hope to meet life's responsibilities and greater opportunity to lead happier and more useful lives."

FORMATION OF INTER-AMERICAN  
ASSOCIATION OF SANITARY  
ENGINEERING

Twice during 1946, representatives of sanitary engineering and sanitation from the various 21 American republics gathered together to discuss mutual problems and goals. The first meeting was held in Rio de Janeiro, Brazil, the second in Caracas, Venezuela. (See August and September issues, 1946, *A.J.P.H.*, News from the Field, for further details.) Out of these meetings came a firm belief that an understanding between the peoples living in the various American republics could be accomplished most effectively through social, professional, and economic coöperation. It was the unanimous opinion of the representatives attending the conference that formation of an Inter-American engineering group would do more than

foster better understanding between the peoples of the Americas. The group also agreed that such an organization could aid materially in improving public health and economic well-being by improving the application of the sanitary sciences.

Announcement is made by Homer J. Hayward, U. S. Representative on the Membership Committee, of formal plans for the formation of The Inter-American Association of Sanitary Engineering. The purpose of the Organization is:

The principal object of the Association is to reach by common agreement the solution of problems relating to sanitation and the establishment of standards for the uniform and continuous protection of the people of the hemisphere. This purpose may be accomplished by the following means:

- a. Deveopment of sanitary engineering.
- b. An interchange of ideas and scientific information concerning deveopments of Sanitary Engineering in the Americas.
- c. Establishment of standards of sanitation for the Americas.
- d. Promote more rapid advancement in the sanitation of the several countries of America as a necessary basis for economic and social development.
- e. Establish good will and better understanding among the persons engaged in sanitation work in the Americas.

Membership is open to engineers and others engaged in sanitation activities in official, nonofficial, or commercial organizations. Yearly dues are \$3 with a \$2 initiation. The initiation fee will be waived in the case of all applying for membership prior to the next conference in November, 1947. Membership prior to the November, 1947, meeting will entitle the individual to the classification of "Charter Member," also. The yearly dues will include subscription to the official publication which will appear on a quarterly basis.

Application blanks for membership can be obtained from Mr. Hayward, Inter-American Association of Sanitary Engineers, N.W. Corner, 17th and Constitution Ave., Washington 6, D. C.

## PERSONALS

## Central States

GEORGE D. BRIGHAM, PH.D.,\* formerly Senior Bacteriologist, Pitman-Moore Biological Laboratory, Zionsville, Ind., has been appointed Assistant to the Director, Biological, Manufacturing and Finishing Division, Parke, Davis & Company, Detroit, Mich.

WILLIAM C. HARRISON, M.D.,† formerly of Minneapolis, became Director of the Delta-Menominee district health department at Powers, Mich., on July 1, after receiving the master's degree in public health from the Michigan School of Public Health.

RUSSELL E. PLEUNE, M.D.,† has resigned as Director. Northern Peninsula office, Michigan State Department of Health, and has accepted the position of Chief, Tuberculosis Section, McCloskey Veterans' Hospital, Temple, Tex.

R. E. SERFLING† is the head of the new Division of Public Health Statistics in Indiana. H. M. WRIGHT, remains as Director of Vital Records.

JOHN B. YOUMANS, M.D., Dean of the University of Illinois College of Medicine, Chicago, left April 11 for Berlin, Germany, to serve as nutrition consultant in a survey of the American, British, and French occupation zones by a twelve man committee.

## Eastern States

CHARLES A. R. CONNOR, M.D.,† was recently appointed as Associate Medical Director of the American Heart Association, New York, N. Y., to work with DAVID D. RUTSTEIN, M.D.,\* Medical Director, in the development of the Association's Program of research, service, and public education in diseases of the heart and circulation. Dr. Connor entered on active duty in the U. S. Army in 1942. He was active in the Air Sur-

geon's Rheumatic Fever Control Program and was the editor of its monthly newsletter.

CAMERON ST. CLAIR GUILD, M.D.,\* was appointed as assistant chief of the tuberculosis section of the Veterans Administration Branch Office No. 2 at New York City, beginning May 1. He was formerly executive secretary of the American Trudeau Society and director of special programs for the National Tuberculosis Association, New York, N. Y.

W. ALLEN LONGSHORE, JR., M.D.,† began his duties recently as Deputy Commissioner of the Ulster County, N. Y., Health Department, following completion of work for the degree of Master of Public Health at Johns Hopkins University. During the war he served with a medical relief unit in India, China, and Mexico and since 1946 has been in the New York State Health Department.

## NEW PERSONNEL IN THE MASSACHUSETTS STATE DEPARTMENT OF HEALTH:

ROBERT E. S. KELLEY, Captain MC, USN (Ret.), and ROBERT G. BENSON have been appointed to the Division of Biologic Laboratories, the former as physician in charge of the 2nd Mobile Unit and the latter as field supervisor of the Blood Donor Program.

WALTER J. PENNELL, Captain MC, USN (Ret.), and PAUL RICHMOND, Captain MC, USN (Ret.), have been appointed District Health Officers respectively of the Northeastern and the Worcester District.

VICTORIA M. CASS, M.D., CLAIRE F. RYDER, M.D., BROOKS RYDER, M.D., and JOSEPH H. HANSON, M.D., have been appointed as Epi-

\* Fellow, A.P.H.A.  
† Member, A.P.H.A.

demiologists, the first two in the Division of Administration, the third in the Division of Local Health Administration, and the last named in the Division of Communicable Disease.

ISAH L. SALZMAN and MARGARET M. HAEHNEL have been appointed as Social Workers in the Northeastern and South Metropolitan districts respectively.

NICHOLAS J. FIUMARA, M.D.,† formerly Health Officer of the Berkshire District, has been promoted to Director of the Division of Venereal Diseases, State Department of Public Health, pending qualification by the Division of Civil Service. He succeeds the late GEORGE E. PERKINS, M.D.

A. GARALDINE WHITE has been appointed Research Consultant in the Child Growth and Development Program, Division of Maternal and Child Health.

MARY CARR BAKER has been appointed Personnel Training Coordinator.

ALFRED NEWTON RICHARDS, Professor of Pharmacology at the University of Pennsylvania Medical School, and winner of one of the 1946 Lasker Awards of the A.P.H.A., on July 1 took office as President of the National Academy of Sciences for a four year term.

THOMAS M. RIVERS, M.D.,\* Director of the Hospital of the Rockefeller Institute for Medical Research, New York, delivered the annual Cutter Lecture on preventive medicine at Harvard University School of Public Health, Boston, April 22, on public health aspects of infectious disease.

WILLIAM H. SAVIN has been appointed National Director of the American Epilepsy League, Inc., Boston. Just released from the army as lieutenant colonel, Mr. Savin spent 3 years in military government in Italy. He was

formerly executive director of the Family Service Association, Washington, D. C.

ELLEN THAYER, editor-in-chief for the Division of Publications and a member of the Commonwealth Fund staff since 1930, retired on March 31. BEULAH DIMMICK CHASE, since 1941 editor of publications at the Metropolitan Museum of Art, New York, N. Y., has succeeded her.

PAULINE BROOKS WILLIAMSON\* recently retired as Chief of the School Health Bureau of the Metropolitan Life Insurance Company, New York, N. Y., a position she has held since the Bureau was first organized in 1925. She will continue as a member of Metropolitan's Advisory Educational Group and will serve as consultant to various groups. She was succeeded by MARJORIE L. CRAIG,\* who has been in the School Health Bureau since 1937, for the last 3 years as Assistant Director.

### Southern States

H. T. BAUGH, M.D., has accepted the directorship of the tri-county Becker, Custer, and Washita Health Department with headquarters at Clinton, Okla., according to an announcement made by JOHN W. SHACKELFORD, M.D.,\* the state's Director of Local Health Services.

ELMER C. KEFAUVER, M.D.,† for 20 years Health Officer of Frederick County and also of the city of Frederick, Md., retired July 1. DONALD J. ROOP, M.D., who was recently appointed assistant health officer succeeded Dr. Kefauver.

W. L. MUSSER, M.D., a McGill graduate, on May 15 became Health Officer of Pike County, Mississippi, which has been without a health officer since November 1945.

ROY T. REM, Acting Director of the Division of Public Health Education of the Arkansas State Health De-

partment, has returned to Arkansas after securing the degree of Master of Public Health from the Yale University School of Public Health.

MARGARET RICE, M.Sc.,† was appointed supervisor of Public Health Statistics in the Mississippi State Department of Health on February 3.

ERNEST L. STEBBINS, M.D., M.P.H.,\* Professor of Public Health Administration, Johns Hopkins University, Baltimore, Md., has been appointed Chairman of the Advisory Board on Health Services of the American Red Cross.

#### Western States

C. S. AMBROSE, M.D., has been appointed Health Officer of Tulare County, Calif., to succeed CHARLES C. HEDGES, M.D.

LAMAR A. BYERS, M.D., M.P.H.,† has joined the staff of the Washington State Department of Health as Supervisor of Crippled Children's Services. Dr. Byers has served as a health officer in both Tennessee and Texas.

JAMES T. GOOGE, M.D.,\* has been named Clatsop County Health Officer by the Clatsop County Commissioners, Oregon. He has served as Director of Local Health Services in the Florida Health Department, was Assistant State Health Officer in Nebraska, and most recently was with the United Nations Relief and Rehabilitation Administration as Regional Medical Officer in China.

HARVEY F. HENDRICKSON, M.D., has been appointed to assist J. B. ASKEW, M.D., in the administration of the Bureau of Hospital Inspection, California's State Department of Health. During the past year, he has been assistant superintendent of the San Francisco City and County Hospital.

GLEN H. HOWE has joined the staff of

the Oregon State Board of Health as field inspector in the Bedding and Upholstering Section, Division of Sanitary Engineering.

RAYMOND E. LEACH,\* recently discharged from military service with the rank of Lieutenant Colonel, Sanitary Corps, is now Director of Laboratories of the San Diego City and County Health Dept., Calif.

MABEL C. MCCONNELL was recently appointed to the staff of the Hawaii Territorial Department of Health as psychiatric social worker in the Division of Mental Hygiene. She will serve on the island of Kauai.

PHILIP MOORE, M.D., was recently appointed as Orthopedic Surgeon for Mt. Edgecumbe Hospital at Sitka, Alaska, and Orthopedic Consultant for the Territorial Department of Health. During the war he served as a lieutenant commander, U. S. Navy Medical Corps in various capacities. For the past 2 years Dr. Moore has been surgeon to the Greeley Clinic, Greeley, Colo.

CATHERINE SHERWOOD, M.D.,† arrived in Juneau in April to become Director of Maternal and Child Health and Crippled Children's Services, Alaska Department of Health, succeeding BERNETA BLOCK, M.D. Dr. Sherwood had previously been field pediatrician for the California State Department of Public Health and later Acting Health Officer of Ventura County, California.

PAUL SHIPLEY† took charge of statistics and records for the California Dept. of Public Health on June 1.

AUSTIN U. SIMPSON, M.D.,\* head of the Washington State Health Department's laboratory section, was honored by his staff recently upon completing 26 years' service. He was presented with a congratulatory letter from the Governor and a gold watch. WILLIAM H. GAUB, Ph.D.,\* has succeeded Dr. Simpson effective

\* Fellow, A.P.H.A.

† Member, A.P.H.A.

# American Journal of Public Health

## and THE NATION'S HEALTH

---

Volume 37

August, 1947

### Health Councils in Local Communities\*

BLEECKER MARQUETTE, F.A.P.H.A.

*Executive Secretary, Public Health Federation, Cincinnati, Ohio*

THE health council is potentially one of the most valuable and powerful health forces in a community"—so the Gunn-Platt Study of Voluntary Health Agencies concluded.

#### WHEN TEAMWORK IS LACKING

A look at the situation in a Midwest city may serve to show what can happen when there is no machinery to coordinate the many and varied groups carrying on some phase of health work or to plan for the community's health.

This particular city has a population of about 400,000 and the county an additional 100,000.

The city and the county health departments are both very poor—woefully understaffed and inadequately financed. Nobody is doing anything to try to get more money for the departments, to raise their standards, or to study the possibility of combining the two into one centralized department so that every dollar available for official health department service may produce maximum benefit to the community.

The dental society, working alone and without help from any quarter, is doing all that is being done in dental

health, but this is limited to lectures and exhibits in the public schools. There is no program for prophylaxis and there are no clinics for treatment.

In nursing they have a bedside service rendered by insurance companies to their own policy holders but no such service for others, some nurses in the health departments but none in the schools. The shortage of nurses is serious in hospitals and in public health agencies. The professional nursing association is struggling with the problem, but there is no general community interest in it and no community program for meeting nursing needs.

The schools are just beginning to develop health education.

For the rapidly increasing numbers of chronic cases needing care, the county home provides custody only. Low-income patients go into the workhouse hospital when on rare occasions there happens to be a vacant bed. Nothing is being done to meet the broader problem.

There are no general medical clinics and no mental hygiene clinics.

The health department furnishes the staff for the tuberculosis clinic, but has to depend upon the tuberculosis association to furnish the building in which

\* Special Review Article prepared at the request of the Editorial Board.



it operates, to pay the nurses and the cost of x-ray services.

An infantile paralysis committee collects funds but has no service program. The local branch of the American Cancer Society, besides fund raising, refers people to doctors. There is no educational campaign in regard to cancer.

Nothing is being done in a public health way about diabetes, heart disease, nutrition, or social hygiene.

Nobody has a comprehensive picture of the community's specific health needs. There is no organized way of bringing together interested citizens, the professions concerned, and health executives to study and plan for the community health.

#### WHEN HEALTH GROUPS PULL TOGETHER

Another Midwest city of not much larger size has had a health council for 30 years. The council is made up of representatives of every official health department, of every voluntary health agency, clinic, and hospital, of the medical, dental, nursing, and pharmacy associations, of civic and social agencies with a direct public health interest. It meets annually to receive reports on the work done and to elect officers and members-at-large to the coordinating committee. This committee is the governing body and meets monthly. The health commissioners are ex-officio members of the coordinating committee. The four professional societies, by constitutional provision, are each entitled to name a member of the coordinating committee. The health council has 13 divisions, each conducting its own program subject to coordinating committee approval. Each division elects its own chairman who serves on the coordinating committee. There are, in addition, a number of subcommittees, some regular and some temporary, dealing with special problems.

In this community the heads of all

health agencies are in touch with what other groups are doing, and they join in continuing study of health problems and programs. There is a minimum of friction and misunderstanding and an awareness of gaps in the community health program.

In all, there are some 500 people, delegates, and division members, participating in the work of the health council. Each month they receive reports on current health developments. As a problem arises calling for united action they are alerted.

The council recognizes the health departments as the proper center of public health activities and does everything in its power to strengthen these departments and help them to secure adequate budgets. They, in turn, have participated wholeheartedly in the coordinated effort to promote the public health. The council believes that the several health departments in the county should be centralized in a single department and has consistently, but so far unsuccessfully, worked to that end.

The council adheres to the policy that when an official department expresses its readiness to take over an activity of a voluntary agency, the transfer should be made without quibble. On the other hand, it scrupulously observes the autonomy of its affiliated agencies and avoids competing with them in any way.

Programs of the various health agencies are constantly observed and from time to time recommendations for modification of programs are made—always on the basis of careful study and with no attempt to force action on any recommendation. As examples, hospital social service provided by voluntary agencies to two public hospitals was taken over by the hospitals; medical direction of an independent clinic was assumed by the College of Medicine while another free-lance clinic was transferred to the direction of the

department of health; a child health agency is gradually integrating certain of its functions with the city health department.

The council has a paid staff consisting of one part-time and three full-time executives, secretarial service, and two extraordinarily competent volunteers, one full-time and the other half-time, who serve just as conscientiously as anyone on the payroll and add great strength to the organization.

Research plays a vital role. Special studies of problems of agencies and institutions are made as the need develops. The tabulation and analysis of mortality statistics is a continuous function. One phase of these studies deals with mortality from various diseases in the different census tracts and compares the experience of various economic and racial groups. It serves to indicate sections of the city in which concentrated effort may be needed on particular problems. Another phase of the mortality studies is concerned with refined and adjusted bases of comparison of this community with comparable cities. In this way, the council learns whether the city is keeping pace with other communities and sometimes where special emphasis needs to be placed. As an example, it was found several years ago that the city's death rate was high from appendicitis. An intensive education campaign, undertaken jointly by the council and the medical society, succeeded over a period of years in reducing the city's rate below the average. Enteritis and diarrheal diseases also were found to take a higher than average toll. The combined efforts of the health department and other health groups has not so far succeeded in effecting substantial reduction in mortality from these causes, but the battle against them goes on. More recently it has been discovered that, after adjustment for age, the rate of death from home accidents is high. A com-

mittee made up of representatives of interested agencies is now at work on this problem.

Comprehensive health education is an important part of the program. It includes two weekly radio programs, feature articles in the press and, in addition, a daily series in one newspaper, a weekly item in another, and a specially illustrated feature in suburban and labor papers. Street cars and busses carry illustrated car cards continuously. Monthly health bulletins are sent to factories, drug stores, and public buildings. A four page leaflet on nutrition is distributed each second month to several thousand low income families. A special leaflet goes each month to members of Negro health clubs. The council provides "Public Health Notes" for the medical society's monthly *Journal of Medicine*. Health chairmen of the Parent-Teacher Association clubs receive a one page message which they read to their members at their monthly meetings. Copy for most of this material is reviewed by representatives of the medical society and the department of health, and most of it carries the names of the three organizations. Lectures, exhibits, and printed leaflets round out the education media used.

As examples of filling in gaps in the program, the establishment of a health center for Negroes where Negro doctors and dentists had their first opportunity locally for clinical experience, and the launching of what has grown to be a most successful central mental hygiene clinic may be mentioned.

The council directed successful campaigns for bond issues to provide better facilities for the city hospital and to build a new county home and chronic disease hospital. Several years ago it joined hands with the tuberculosis association in securing a bond issue which financed the modernization of the tuberculosis hospital.

The legislative committee keeps in

touch with local, state, and national legislation affecting health, and with the backing of its constituent agencies supports desirable bills and opposes objectionable measures.

The need of facilities for the care of the chronic sick and the shortage of nurses are among the problems facing this (and practically every) community. Both are receiving intensive study by local groups with a plan of action as the goal.

Support was given to a vigorous public campaign that led to the enactment of a strong ordinance for smoke control.

As an illustration of good inter-agency teamwork, the tuberculosis association is financing a vigorous joint program in nutrition, directed for the council's nutrition division by a well trained, full-time nutritionist.

Mortality studies having demonstrated excessive rates from certain preventable diseases in slum areas, the council is supporting the uphill battle for decent housing and is calling public attention to low income as an obstacle to health improvement.

A future objective is the development of a master plan for health.

#### ORGANIZATION OF HEALTH COUNCILS

The Gunn-Platt Report studied health committees, divisions, and councils set up in some 34 cities for the purpose of coordinating health activities. It states the purpose of a health council well in these words "to co-ordinate as far as possible the health thinking and planning of all the organizations, public and private, concerned with public health, including the medical, dental, and nursing professions. It studies the health needs of the community and endeavors to develop a community health program to meet those needs. It attempts to stimulate public interest in public health problems, and it may render common health

services in such fields as statistics, research, and health education. It usually expresses itself in matters of health legislation."

The National Committee of Health Council Executives has set down certain principles which it considers essential for the successful organization and functioning of a health council. Among them are: that it be representative of the recognized health forces of the community; that it be without limitation as to race or creed; that it have liaison with recreational and welfare organizations. Recognizing that the form of organization and operation will vary, depending upon local conditions, the health council in large communities, the National Committee states, needs a full-time staff and budget. The executive should have the necessary qualifications and should be chosen by the council in coöperation with the other local agencies involved. The council should determine its own policies but should work in the closest harmony with both the Council of Social Agencies and the Community Chest, where they exist.

From the results of a recent questionnaire survey of 31 cities known to have some kind of coördinating health agency, it is possible to draw some general conclusions as to how they are organized and what they attempt to do. Most of the councils are in cities of over 250,000 population and apparently very few in places of less than 100,000. They are organized almost uniformly under the sponsorship of a Community Chest or Council of Social Agencies—whether they be called health council, section, division, league, federation, or committee. With few exceptions, lay people and the public and private health agencies and the professional societies are represented. Usually, their scope is the county or metropolitan area. Invariably, they aim to promote co-ordination and joint community planning. In the larger communities there

is usually a paid executive but only rarely is the executive selected by the council itself. Few have their own budgets. Usually the Community Chest or the Council of Social Agencies selects the executive and meets the council's expenses out of its own budget. Almost without exception the council determines its own policy and program.

None of the 5 cities of less than 100,000 population has a paid executive.

Types of activity vary greatly. There is no general pattern. Nursing, convalescent care, dental hygiene, the chronic sick, special types of health education, mental health, nutrition, hospital care, surveys of community health facilities, and support of official health departments are among the problems most commonly receiving the attention of these councils.

Exact information as to how many health councils there are in the United States at the present time is not available.

#### SUCCESS OF HEALTH COUNCILS

The Gunn-Platt Report gives the results of its study of 32 health councils. Three-fourths of the 32 were found to be weak and ineffective. Four were rated excellent, and 4 good. Some of the reasons the Report gives for the poor rating of most of the councils are: an executive who lacks drive or has too many duties, inadequate funds, poor working relationship between the health council and the official health department.

There is no magic in the organization of a health council. If there is no such agency, there can be little chance of any real teamwork among health forces or of intelligent community planning. Where such an agency does exist, there is at least an opportunity for effective coordination of effort. But this will not come about automatically just because machinery is set up or a gesture made. A health council in any large community

needs a competent staff—at least an executive who has had enough training in health work to know what it is all about, and enough common sense to know that people have to be dealt with tactfully if they are to pool their efforts with those of others, and to be constantly conscious of the fact that a coordinating agency must give credit graciously and willingly to others and not seek all the credit for itself. The executive must have qualities of leadership and the ability to keep his groups interested, else they will gradually disintegrate. He must encourage them to participate in decisions so that they will feel that they are not looked upon as “rubber stamps.” He must have enough funds to do something about the major programs his groups decide upon. Otherwise they lose interest as they find that things do not get done and tire of fruitless meetings. He must recognize that the official health department is the hub of the wheel of public health, and not try to compete with or detract from the prestige of the health officer. If the health officer is incompetent, then there is a different problem—namely, to try to find ways and means of effecting a change.

The fact that some health councils are getting results shows that in a favorable situation the plan works. The fact that so many are weak indicates difficulties that must be overcome. One of these difficulties is certainly lack of trained people for the executive positions involved. This lack is not likely to be met until schools of public health train more people for public health work in general and give them some instruction in community organization and planning. Another is starvation budgets insufficient to pay adequate salaries and to implement an active program. In the larger communities, one executive staff member is not enough. He quickly becomes overwhelmed with a multiplicity of duties, with the result

that the council's programs remain on paper. Two ways in which financing of health councils might be met suggest themselves. One is that Community Chests recognize that community health problems will not be handled effectively, nor the individual health agencies in the Chest fulfil their best purpose, until there is dynamic health-coördinating machinery and that theirs is the responsibility for financing it. Another is that in sections of the country where the tuberculosis mortality has declined to the point that the problem is well in hand, local tuberculosis associations consider spending some of their funds to set up health councils where they do not exist or to help put them on a sound financial basis where they are starved for funds.

The rapid increase in fund-raising drives for health purposes and the establishment of new local agencies—infantile paralysis, cancer, heart, social hygiene, arthritis, alcoholism, cerebral palsy, multiple sclerosis, epilepsy—is complicating the already confused situation in local communities. Unless there is some kind of effort at co-ordinating the numerous activities going on in our communities, the public is likely to become more and more confused and health work more disparate and stratified.

#### HEALTH COÖRDINATION IN SMALL COMMUNITIES

How about small communities and counties? Do they have problems that require united planning and action? Does a health council or committee have anything to offer them? Unfortunately there is not much experience to go on, but what happened in Lewis County in the State of Washington is illuminating. This county of 42,000 population has no regulations governing the production and sale of milk. Being surrounded by counties that do have such regulations, it has been from time

to time the dumping ground for dairy products that could not be sold elsewhere. The same is true of meat inspection. There is no regulation of eating places. The community needs more hospital facilities and more doctors and dentists.

According to an official of the State Health Department, these conditions exist "not because nobody cares about health problems, but because while many groups wanted something done, there just was not any machinery for getting people together to see that it was done." Some of the leaders began to wonder why they could not have some kind of an organization to present a united front when action was needed—to get an ordinance, to appear before the county commissioners, or to pull together in a joint campaign. Late in 1946, three citizens—one from the Tuberculosis League, one from the County Extension Service, and one from the Health Department—decided that what was needed was a health council. And now they have it, with representatives of these three groups and, in addition, a considerable number of organizations, including the schools, the Grange, the County Medical Society, the Welfare Department, the Red Cross, the Junior Chamber of Commerce, the Medical Auxiliary, the Parent-Teacher Association, the Women's Council, the Cancer Control group, Kiwanis, Optimist Club, as well as dentists, nurses, county commissioners, legislators, and a considerable number of interested lay persons. The council has adopted a constitution, has a voluntary secretary, and meets alternately in the two largest towns in the county.

The first problem that came before the new-born council was where to locate a new hospital for which a bond issue had just been voted. The citizens of each of the two largest cities quite naturally want the hospital in their town.

The only thing agreed upon is that more hospital beds are needed and needed quickly. And so the Health Council has stepped in and is grappling with the problem of finding some acceptable solution.

Says the state health official, "the Health Council will see to it that the need for more beds doesn't 'die in committee' because its job is to keep health needs before the people. In similar ways it will go on to other problems, like obtaining good ordinances governing food handling and milk supplies, getting more doctors and dentists to serve its people, doing something about the shortage of nurses, getting a playground and a swimming pool, and so on down the long line of health needs. The Health Council will bring to these projects the support of organized groups and of citizens and cooperatively solutions will be worked out."

Not every county has needs exactly the same as those of this western community, but it would not be easy to find one that has none. Almost invariably there are a number of groups engaging in or interested in some kind of health work—the professional medical, dental, and nursing societies, the health department, the Red Cross, a tuberculosis association, an infantile paralysis committee, a branch of the American Cancer Society, the schools, a Parent-Teacher Association. It just seems common sense that if these groups can be brought together to pool their knowledge, study their problems, and plan for action, they can get things done that just will not come about so long as there is no "united front."

The plan for organization of a health council for a small county will be of the simplest. What is needed is some kind of agency, whatever it may be called, in which representatives of the interested groups can be brought together regularly to study their prob-

lems, decide what their needs are, and join hands for a common program. Certainly no such community will be able to afford or, in fact, need a full-time paid executive. An interested member of the staff of some one of the health groups may well serve as secretary.

It is unlikely that county health councils will develop rapidly, because most citizens of small counties are not likely to be keenly aware of their health problems, and because leaders with the vision and the drive essential to get a council organized and keep it going are rare. Those facts do not argue that the health council plan is not adapted to such communities or that it will not work under favorable conditions. At present few councils exist in counties that have no large cities or, if they do, information about them is lacking.

#### CONCLUSION

Sixteen years ago Howard Whipple Green, successful executive of the Cleveland Health Council, wrote "After more than 10 years' trial, it now seems clear that the fundamental procedure adopted by health councils is productive of favorable results. When provided with competent personnel, necessary funds, and able guidance, health councils have demonstrated an ability to exert leadership in the public health activities of their respective communities. They have been influential in obtaining the coördination of activities which previously were overlapping or disjointed, they have successfully sponsored the development of new health activities when needed; and, most important of all, they have carried on studies of health needs and have planned and, in considerable degree, brought to fruition programs of development based upon needs rather than upon impulse and guesswork."

Since that time, many new health

councils have been formed. The proportion of effective councils remains disappointingly small. The principal reasons for poor performance are lack of funds, of competent staff and of dynamic leadership. The plan is sound and it works when these requirements are met. Not until national and local leaders in the health field develop an awareness of the fact that "The health council is potentially one of the most valuable and powerful health forces in a community" will the three-fourths of the health councils that are weak be furnished with the ingredients that will make them strong or the many sizeable communities that lack machinery for united action on the health front fill in the present void. It would, indeed,

be unreasonable to expect health councils, even under ideal conditions, to perform miracles. No community with the best directed health council conceivable will solve all its problems. There will still be gaps and plenty of unmet needs. But the gaps and the unmet needs will almost certainly be highlighted with much greater chance that in due time something will be done about them than in the community that continues in ignorance of its own problems.

In the smaller communities, coordinating health machinery will develop slowly. Its pace will be quickened by more demonstrations that it is a practical and, under intelligent leadership, a useful tool for improving the community's health resources.

## Best Sellers in the Book Service for July

An Appraisal Method for Measuring the Quality of Housing: A Yardstick for Health Officer, Housing Officials and Planners.

Part I. Nature and Uses of the Method, 1945.....	\$1.00
Part II. Appraisal of Dwelling Conditions, 1947.....	5.00

The Control of Communicable Diseases, 6th ed., 1945.....	.35
--	-----

Diagnostic Procedures and Reagents, 2nd ed., 1945.....	4.00
--	------

Microbiology of Foods. Tanner. 2nd ed., 1944.....	12.50
---	-------

Microbiology of Meats. Jensen. 1944.....	5.50
--	------

Penicillin Therapy. Kolmer. 2nd ed., 1947.....	6.00
--	------

Standard Methods for the Examination of Dairy Products. 8th ed., 1941, paper.....	2.00
---	------

Standard Methods of the Division of Laboratories and Research of the New York Department of Health. Wadsworth. 3rd ed., 1947.....	10.00
---	-------

Order from the Book Service

AMERICAN PUBLIC HEALTH ASSOCIATION

# Need for Systematic Evaluation of Substandard Housing\*

M. ALLEN POND, F.A.P.H.A.

*Assistant Professor of Public Health, Yale University School of Medicine,  
New Haven, Conn.*

PUBLIC health workers have begun to realize that they cannot afford to take an ostrich-like attitude about housing. With the dawn of this new point of view, numerous questions have arisen involving the mechanics of carrying on a program in healthful housing. It is the purpose here to outline specific activities that may provide benchmarks for administrators who seriously intend to tackle their housing problems.

The history of the public health movement itself provides precedent for organizing a realistic program of housing sanitation. Modern public health had its origins about a century ago in surveys of health and laboring conditions carried on in England by Edwin Chadwick and Southwood Smith, and in this country by Lemuel Shattuck and Stephen Smith. Indeed, the superb work of Stephen Smith and his associates in studying New York slums 80 years ago led to the first housing sanitation program in the United States.<sup>1</sup> Just as these pioneering ventures focused attention on specific problems of moment to everyone, so might we expect intensive work in the hygiene of housing to be a product of an earnest and well directed study of modern health and housing conditions.

No wise public administrator would consider undertaking a program of action without having some basis of demonstrated need. Abraham Lincoln has stated this well: "If we could first know where we are and whither we are going, we could better judge what to do and how to do it." In the field of housing, health administrators have found that they need facts upon which to build a program. As a result of the Housing Census of 1940 and of many real property inventories, we know that approximately one-third of the population lives in substandard housing. In September, 1946, the National Housing Administrator reported that 2,000,000 married veterans were living doubled-up or in stop-gap quarters, and that 4,000,000 wanted to rent, buy, or build. It is the task of local officials to find those of their neighbors who are inadequately housed, and on the basis of those findings, to plan action which ultimately will lead to an improvement of housing through the elimination of slums and the arrest of spreading blight. Experience has shown that health authorities are well able to make these preliminary determinations.

Health departments have long been depositories of data on occupied housing, particularly multi-family units. However, a decade ago, when the public housing program began in the United States, health officers were not in position to use their files for detailed infor-

\* Presented at a Joint Session of the Health Officers and Engineering Sections of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 14, 1946



mation on local housing conditions. Furthermore, few health officials today are in position to provide precise information on housing standards. Studies at the National Bureau of Standards of many state and local building codes and regulations have revealed phenomenal differences between basic requirements. For instance, local standards for light, heat, and ventilation are widely at variance, and evidence is abundant that progress in scientific discovery is particularly slow in being reflected in building and housing codes and regulations.

Even though a health department has personnel competent to develop modern standards and regulations concerning housing and its sanitation, significant constructive action to improve housing conditions is unlikely until specific information relative to local housing needs is at hand. The drafting of legislation alone cannot solve many problems in a society such as ours. Probably the most important single step that a health officer can take in the field of housing is to accumulate precise data concerning individual premises throughout the community, including the aggregation of these premises into areas significant for administrative policy and action.

Studies of administrative practices in city health departments have revealed that aimless inspection of housing brings few tangible results and does practically nothing toward the improvement of the total housing picture. For instance, in several cities relatively ambitious but inadequately directed housing inspections carried on over a long period of time have done nothing toward eliminating the poorest housing. Indeed, blight has been spreading and getting more serious, and new slums are being created despite the routine housing inspection programs. It is self-evident that the sporadic inspections which have been traditional in many urban health departments are unlikely to produce any body of actionable information.

Studies of the mechanics of complaint investigations in city health departments have revealed that many housing problems are reported by citizens.<sup>2</sup> The distribution of housing complaints in terms of time and space is spotty at best, and frequently such complaints involve no basic problems. Furthermore, routine investigations of complaints usually are directed exclusively at the situation that precipitated the complaint and ignore other aspects of the premises. Thus, the investigator frequently fails to do anything more than suggest palliative action or symptomatic treatment.

Another shortcoming of traditional housing inspections has been that they reflect the bias and personality of the inspector. It is axiomatic that individuals of dissimilar training may react differently to given sets of circumstances. Unfortunately, the forms supplied to most health department inspectors for recording and reporting are not designed to improve the objectivity of the individual. Thus, information gathered on housing conditions may be quantitatively adequate, but qualitatively almost worthless.

Because of these deficiencies in existing practice, it is likely that heroic steps will have to be taken to recast the approach to housing sanitation. In the few cities where health departments have squared with housing problems, almost without exception the initial activities have involved surveys of existing conditions.<sup>3</sup> As a basis for developing any new health program, a careful study of what is needed has much to offer.

Certain facts that will classify the quality of existing housing are necessary if an action program is to be developed. It is essential to know which areas meet accepted minimum standards of dwelling and environmental quality. There should be information about areas showing early or moderately advanced

blight, where it would be possible economically to restore both the dwellings and environment to an acceptable minimum standard by enforcement of suitable legislation. Areas should be delimited in which the quality of dwellings or environment, or both, is so bad that it would be foolhardy to attempt to rehabilitate either for housing purposes.

In a well rounded survey, it would be expected that descriptive as well as qualitative information on familial and structural characteristics would be assembled. For instance, data on family size, dwelling unit size, and types of housing structures are essential in planning for rehabilitation and new construction.

There invariably needs to be replanning of areas in which enforcement is not sensible. Comprehensive and specific information relative to the entire local housing problem is basic to the development of an urban plan.<sup>4</sup> Planners deal with neighborhoods. The quality of existing neighborhoods is determined in large measure by summing the quality of individual pieces of property. Experience has shown that subjective impressions gained haphazardly are not satisfactory for planning purposes. Without facts gathered objectively, it is impossible to plan intelligently. A survey properly organized and wisely directed will furnish the facts that are needed for planning purposes.

Pertinent local housing legislation is the backbone of a real enforcement program.<sup>5</sup> Sensible legislation can be developed only if there is an understanding of the basic elements of design, maintenance, and occupancy. Local characteristics play such an important rôle in the development of ordinances and regulations that it is unlikely that standard housing codes developed by national groups can ever have specific validity everywhere. A local housing survey would be expected to provide informa-

tion that would strengthen any existing codes, and that would form the basis for amending realistically any suggested standard codes.

Health officers and sanitary engineers frequently ask if a housing survey can be done on the basis of routine inspections or complaint investigations. The answer to that question depends to a large extent on local conditions. The most economical method of carrying on a housing survey is to conduct it as a specific job with systematic coverage of significant areas. It is difficult to build up a body of useful information based on a routine, haphazard inspection program. In addition, unless actionable areas are specifically mapped out in detail and information about them is collected within a short period of time, the accumulation of data necessary to plan a program may take so long that conditions will change before there is any programmed action. The condition of housing is never static. In general, it would seem advisable, wherever possible, to carry on a survey as an intensive job and not to dilute an appraisal with other more routine activities.

The Committee on the Hygiene of Housing of the A.P.H.A., after several years of thorough study, has developed an appraisal technic for the objective measurement of the quality of urban housing.<sup>6, 7</sup> This system is designed precisely to meet the needs outlined above. The method deals with structural, dwelling unit, and environmental items that are of health significance. It now has been used officially in several cities including Portland, Me., New Haven, Conn., Milwaukee, and Los Angeles, and it will be utilized widely elsewhere in the immediate future. There no longer can be doubt as to the validity of this tool for general urban use, regardless of geographic, climatic, or cultural differences that may exist between the New England communities where it was developed and cities in

other parts of the country. The primary value of this method centers around its objectivity. Subjective data are practically impossible to use in a large program. The appraisal technic substantially eliminates subjective evaluation of premises being inspected.

Users of the technic have been impressed with its completeness as well as its objectivity. With this one tool it is possible:

1. To evaluate the relative quality of the environment, the structure, and the dwelling unit.
2. To reveal substandardness of dwellings in terms of facilities, maintenance, and occupancy conditions.
3. To measure these deficiencies by scoring on an arithmetic scale of penalty points, and thus compare housing quality within and between communities.
4. To focus attention on basic deficiencies of singular health importance while, at the same time, describing minor and less important defects that in the aggregate are of public health significance.

Negotiations are in process between the Sanitary Engineering Division of the Public Health Service and the Technical Staff of the Committee on the Hygiene of Housing relative to means of facilitating the use of this technic by local officials who wish to use it. It is hoped that within the foreseeable future specially trained personnel from the Public Health Service will be available to state and local health officials to assist them in organizing local housing studies. In the meantime, the staff of the Committee on the Hygiene of Housing is available on a consultant basis to assist in setting up studies utilizing the new appraisal technic.

Success in any endeavor is not happenstance. Rather it is the result of planned application of known facts. The solution of the basic housing problem in this country is not to be found in the indiscriminate building of a tremendous number of dwellings. If we are agreed that one-third of the population is ill-housed, then we are faced with the fact that 15 million families need better housing. At present it would cost (at \$1,200 per room) at least 90 billion dollars to provide enough new housing to meet this immediate need. To be realistic, it is unlikely that this much money will be spent for new dwellings during the next quarter of a century. It is essential, therefore, that a major part of the existing housing supply be rehabilitated and preserved if every American is to have satisfactory shelter within the foreseeable future. Do you or does anyone else in your community now know with reasonable exactness which houses should be torn down and which neighborhoods can be preserved?

#### REFERENCES

1. Smith, Stephen. *The City That Was*. New York: F. Allaben, 1911.
2. Pond, M. Allen. Nuisance Complaints and Municipal Health Department Practices. *Pub. Health Rep.*, 60:381 (Apr. 6), 1945.
3. Krumbiegel, E. R. An Appraisal Method for Housing Conditions and Needs. *The Municipality*, 40:259 (Dec.), 1945.
4. Ascher, Charles. *Better Cities*. Washington: National Resources Planning Board. April, 1942. 22 pp.
5. The Improvement of Local Housing Regulation Under the Law. *A.J.P.H.*, 32:1263 (Nov.), 1942.
6. *An Appraisal Method for Measuring the Quality of Housing*. Committee on the Hygiene of Housing, American Public Health Association, New York, 1945, 71 pp.
7. Solow, Anatole A. Measuring the Quality of Urban Housing Environment. *J. Land and Pub. Utility Econ.*, 22:282 (Aug.), 1946.

# Microbiology of Spray-dried Whole Egg

## II. Incidence and Types of Salmonella \* †

MATHILDE SOLOWEY, PH.D., AND  
VERNON H. McFARLANE, PH.D.

*Microbiology Research Division, Bureau of Agricultural and Industrial Chemistry,  
U. S. Department of Agriculture, Philadelphia, Pa.*

AND

E. H. SPAULDING, PH.D., AND CECILIA CHERMERDA

*Department of Bacteriology and Immunology, Temple University School of  
Medicine, Philadelphia, Pa.*

EARLY in 1942, the British Food Mission called attention to the fact that Salmonella were being isolated from dried egg powder received in the British Isles for food purposes. It emphasized the undesirability of such contamination in a food product. The British findings, however, were limited and restricted. In 1943, Seligmann, Saphra and Wassermann<sup>1</sup> reported the isolation of *Salmonella senftenberg* from a sample of egg powder. In the same year, Gibbons and Moore<sup>2</sup> reported the isolation of 9 types of Salmonella from Canadian spray-dried whole egg powder. This meager background of information made it clear that an investigation into the nature and extent of Salmonella contamination in dried egg should be undertaken.

The incidence and types of Salmonella found in spray-dried whole egg powder manufactured in the United States between September 1, 1943, and

January 1, 1945, are presented in this paper. This is the second one dealing with the microbiology of powder having a high moisture content (4 to 6 per cent) and involving the same series of samples. U. S. Department of Agriculture and War Food Administration purchase specifications regulating the manufacture of powder for Lend-Lease shipment and the collection of samples for microbiological analyses have been cited previously.<sup>3</sup>

### METHODS

Several procedures were tried for the isolation of Salmonella in egg powder, and the one described below was adopted for the major portion of the investigation.

Twenty-five and 50 ml. of a 1:10 dilution of egg powder (11 gm. in 99 ml. saline) were each introduced into 50 ml. of Selenite-F (B-B-L) enrichment broth and incubated for 18 to 24 hours at 37° C. Each dilution was then streaked out on three selective plate media: Shigella-Salmonella (SS) agar (Difco), bismuth sulfite agar (Difco), and desoxycholate-citrate agar (B-B-L). After 18 to 24 hours' incubation at 37° C. on the selective media, characteristic

\* This investigation was undertaken in cooperation with the Poultry Branch, Production and Marketing Administration, U. S. Department of Agriculture, Washington, D. C.

† Presented before the Laboratory Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 12, 1946.

TABLE 1  
Incidence of *Salmonella* in Spray-dried Whole Egg Powder

Number samples contributed by each plant	Number plants contributing samples	Number samples examined	Number samples positive for <i>Salmonella</i>	Per cent samples positive for <i>Salmonella</i>	Range of <i>Salmonella</i> types isolated per plant
1-25	45	518	164	31.7	0-7
26-50	30	1,098	338	30.8	1-11
51 or more	25	3,582	1,308	36.5	3-27
Total	100	5,198	1,810	34.8	0-27

single colonies of suspected *Salmonella* were transferred to tryptose broth. Kligler's Iron Agar (Difco) slants were inoculated from the 18 to 24 hour (37° C.) tryptose broth cultures. Those cultures characteristic of *Salmonella* on Kligler's were purified, and selected colonies were transferred to tryptose agar slants for maintenance of stock.

Although hydrogen sulfide production in Kligler's was one of the primary criteria for the preliminary identification of *Salmonella*, follow-ups were made on cultures which appeared to be *Salmonella* but apparently produced little or no hydrogen sulfide. Such organisms are comparatively rare; nevertheless several strains of *S. senftenberg* which produced no hydrogen sulfide were isolated.

From the tryptose agar slants, further tests required to confirm the preliminary identification of *Salmonella* were made, namely, motility (semi-solid agar and hanging drop), production of hydrogen sulfide and indol, liquefaction of gelatin, and the fermentation of lactose, sucrose, dextrose, salicin, maltose, mannitol, arabinose, xylose, inositol, and sorbitol. Cultures giving the characteristic biochemical reactions were tested for the "O" antigens (B, C<sub>1</sub>, C<sub>2</sub>, D, E). Final identification was based on the reactions of the antigenic components with known sera and with the aid of the Kauffmann-White schema.<sup>4, 5</sup>

#### RESULTS

A total of 5,198 samples of spray-dried whole egg powder were examined

for the presence of organisms belonging to the *Salmonella* group. They were forwarded from 100 dehydration plants located in 26 states. *Salmonella* were isolated from 1,810 samples (35 per cent). Five hundred and sixty-two samples (11 per cent) were positive for *Salmonella pullorum*. Ninety-five plants contributed *Salmonella*-positive samples. Five plants failed to give *Salmonella*-positive samples; these plants, however, contributed a total of only 71 samples for examination.

*Incidence and Types, by Plants*—Table 1 lists the number of plants contributing samples of egg powder for examination, the number of samples examined, the number and percentage of samples positive for *Salmonella*, and the number of *Salmonella* types isolated. The plants were grouped for convenience according to the number of samples examined.

Forty-five plants each contributed 1 to 25 samples. Of 518 such samples examined, 164 (32 per cent) were positive for *Salmonella*. The number of *Salmonella* types found in samples from individual plants ranged from 0 to 7. Thirty-five plants in this group forwarded samples containing *S. pullorum*. In most instances in which there were only one or two positive samples from a plant, the samples contained *S. pullorum*.

Thirty plants contributed 26 to 50 samples each for *Salmonella* examination. Of 1,098 samples examined, 338 (31 per cent) were positive for *Salmonella*. The number of types obtained

TABLE 2

*Incidence of Salmonella in Spray-dried Whole Egg Powder, by Individual Plants  
(Plants which forwarded 51 or more samples)*

Plant No.	Number samples examined	Number samples positive for Salmonella	Types of Salmonella isolated	
			Number	Name
1	86	17	3	pullorum, oranienburg, give.
2	156	84	11	pullorum, oranienburg, newington, typhimurium, anatum, monteideo, bareilly, oslo, tennessee, worthington, cerro.
5	82	26	9	pullorum, monteideo, oranienburg, bareilly, anatum, typhimurium, newington, tennessee, meleagridis.
6	248	90	18	pullorum, oranienburg, cerro, urbana, monteideo, senftenberg, newport, georgia, anatum, tennessee, litchfield, worthington, bredeney, meleagridis, give, typhimurium, manhattan, bareilly.
11	64	43	17	pullorum, budapest, monteideo, poona, oranienburg, newport, braenderup, bareilly, oregon, london, anatum, rubislaw, new brunswick, javiana, paratyphi B, worthington, norwich.
13	545	170	27	pullorum, monteideo, anatum, oregon, senftenberg, derby, muenchen, rubislaw, typhimurium, oranienburg, tennessee, arechavaleta, newport, braenderup, meleagridis, newington, bareilly, litchfield, cerro, worthington, thompson, paratyphi B, manhattan, simsbury, minnesota, london, give.
14	111	70	16	pullorum, oranienburg, madelia, newport, monteideo, meleagridis, tennessee, give, bredeney, bareilly, anatum, cerro, kentucky, saint paul, worthington, london.
16	88	34	13	pullorum, monteideo, choleraesuis var. kunzendorf, give, kentucky, oranienburg, newport, senftenberg, typhimurium, simsbury, anatum, tennessee, javiana.
17	194	80	11	pullorum, meleagridis, london, senftenberg, anatum, oranienburg, vejle, monteideo, typhimurium, bareilly, tennessee.
18	146	22	6	pullorum, monteideo, bareilly, tennessee, oranienburg, derby.
19	64	45	16	pullorum, anatum, london, oranienburg, newport, meleagridis, typhimurium, typhimurium var. copenhagen, kentucky, rubislaw, newington, monteideo, california, minnesota, thompson, cerro.
20	72	35	9	pullorum, bareilly, typhimurium, typhimurium var. copenhagen, senftenberg, tennessee, cerro, lexington, oranienburg.
21	195	42	10	pullorum, typhimurium, tennessee, give, oranienburg, bareilly, monteideo, oregon, anatum, bredeney.
22	166	60	16	pullorum, derby, oranienburg, anatum, monteideo, senftenberg, bareilly, newport, london, give, worthington, typhimurium, lexington, rubislaw, tennessee, thompson.
23	117	32	8	pullorum, anatum, oranienburg, monteideo, typhimurium, tennessee, meleagridis, give.
24	234	62	12	pullorum, tennessee, give, london, derby, oranienburg, monteideo, typhimurium, meleagridis, anatum, bareilly, newington.
25	230	50	11	pullorum, monteideo, tennessee, oranienburg, oregon, manhattan, bareilly, anatum, give, new brunswick, meleagridis.
27	160	114	21	pullorum, monteideo, newport, oslo, oranienburg, anatum, bareilly, worthington, tennessee, derby, give, cerro, san diego, meleagridis, kottbus, oregon, gaminara, poona, javiana, newington, thompson.
28	127	38	13	pullorum, monteideo, bredeney, oranienburg, oregon, tennessee, anatum, london, cerro, panama, newport, newington, derby.
30	122	21	6	pullorum, monteideo, tennessee, oranienburg, london, thompson.
31	58	10	5	pullorum, bareilly, oranienburg, typhimurium, typhimurium var. copenhagen.
32	96	56	10	pullorum, oranienburg, tennessee, madelia, pomona, monteideo, bareilly, anatum, typhimurium, derby.
37	78	40	13	pullorum, monteideo, senftenberg, oranienburg, newington, thompson, anatum, tennessee, meleagridis, typhimurium, minnesota, london, give.
40	72	32	9	pullorum, tennessee, oranienburg, typhimurium, bareilly, senftenberg, bredeney, monteideo, meleagridis.
42	71	35	13	pullorum, bareilly, monteideo, potsdam, newport, oranienburg, minnesota, worthington, manhattan, meleagridis, anatum, typhimurium var. copenhagen, horsham.
Total	3,582	1,308		

from the individual plants within this second group ranged from 1 to 11. All but 3 of the 30 plants contributed one or more samples which contained *S. pullorum*. *S. pullorum* was the only type isolated from 5 positive samples received from one plant. In contrast, 11 types were isolated from 24 positive samples received from another plant.

Twenty-five plants each contributed 51 or more samples for *Salmonella* examination. The 3,582 samples examined from plants within this third group represent 69 per cent of all the samples examined. *Salmonella* were isolated from 1,308 (37 per cent) of the samples. The number of *Salmonella* types isolated from the individual plants ranged from 3 to 27. Table 2 lists the plants within this group, the number of samples examined from each plant, the number positive for *Salmonella*, and the number and types of *Salmonella* isolated. It may be seen that each of the plants furnished one or more *pullorum*-positive samples. Eight plants—1, 18, 21, 23, 24, 25, 30, 31—had *Salmonella* contamination in less than 30 per cent of the samples.

Ten plants—5, 6, 13, 16, 17, 20, 22, 28, 40, 42—had *Salmonella* contamination in 31 to 50 per cent of the samples. In 7 plants—2, 11, 14, 19, 27, 32, 37—more than 50 per cent of the samples were contaminated with *Salmonella*.

One hundred and fourteen (71 per cent) of 160 samples from plant 27 contained *Salmonella* representing 22 types. Plant 13 contributed the largest number of samples for examination. Of 545 samples examined, 170 (31 per cent) were positive for *Salmonella*. Despite a comparatively low incidence, the largest number of *Salmonella* types (27) were isolated from samples contributed by this plant.

*Incidence and Types, by Months*—The percentage contamination from June through December, 1944, was greater than that for the preceding 9 month period (Table 3). The peak of the contamination (52 per cent) was reached in August–September, 1944. In general, *Salmonella*-positive samples were more frequently encountered during the warm summer months; the percentage of samples contaminated for the months of July, August, and September,

TABLE 3

*Incidence of Salmonella in Spray-dried Whole Egg Powder, by Months*

Month	Number plants contributing samples	Number samples examined	Samples positive for <i>Salmonella</i>					
			<i>S. pullorum</i>		Other types		All types	
			No.	%	No.	%	No.	%
1943								
Sept.	14	124	2	1.6	13	10.5	15	12.1
Oct.	29	212	0	0	55	25.9	55	25.9
Nov.	29	320	0	0	84	26.3	84	26.3
Dec.	29	208	2	1.0	51	24.5	53	25.5
1944								
Jan.	67	398	46	11.6	58	14.6	104	26.2
Feb.	78	608	135	22.2	101	16.6	236	38.8
Mar.	52	315	56	17.8	31	9.8	87	27.6
Apr.	64	523	86	16.4	70	13.4	156	29.8
May	66	517	56	10.8	86	16.6	142	27.4
June	62	391	44	11.3	105	26.9	149	38.2
July	56	327	24	7.3	122	37.3	146	44.6
Aug.	41	366	44	12.0	145	39.6	189	51.6
Sept.	39	273	14	5.1	128	46.9	142	52.0
Oct.	54	264	21	8.0	85	32.2	106	40.2
Nov.	41	219	18	8.2	65	29.7	83	37.9
Dec.	27	133	14	10.5	49	36.8	63	47.3
Total	109	5,198	562	10.8	1,248	24.0	1,810	34.8

TABLE 4

*Incidence of Salmonella in Spray-dried Whole Egg Powder, by U. S. Divisions*

Divisions	Number plants contributing samples	Number samples examined	Samples positive for Salmonella					
			<i>S. pullorum</i>		Other types		All types	
			No.	%	No.	%	No.	%
North Atlantic - (N. Y. and Pa.)	5	91	14	15.4	6	6.6	20	22.0
East North Central (Ohio, Ind., Ill., Mich. and Wis.)	26	1,357	170	12.5	274	20.1	444	32.6
West North Central (Minn., Iowa, Mo., N. Dak., S. Dak., Nebr. and Kans.)	40	1,563	189	12.1	255	16.3	444	28.4
South Atlantic (N. Carolina)	1	41	5	12.2	0	0	5	12.2
South Central (Ky., Tenn., Ala., Miss., Ark., La., Okla. and Tex.)	24	1,873	156	8.3	611	32.6	767	40.9
Western (Colo., N. Mex. and Wash.)	4	273	28	10.3	102	37.4	130	47.7
Total	100	5,198	562	10.8	1,248	24.0	1,810	34.8

were 45, 52, and 52, respectively. *S. pullorum* contamination was high in samples examined during February (22 per cent), March (18 per cent), and April (16 per cent). No satisfactory explanation was apparent for this finding.

It is difficult to discern any parallelism in trends in 1943 and 1944 during the months of September, October, November, and December. In so far as the data go, the incidence of *Salmonella* contamination was considerably lower for these four months in 1943 than in 1944. The comparatively low percentage (12 per cent) of contamination for September, 1943, may be attributed to the fact that only one gram of powder from each sample was tested during this particular month. In all later months, 2½ and 5 gm. quantities of powder were tested.

*Incidence and Types, by U. S. Divisions*—Table 4 shows that the South Central and Western divisions furnished samples having the highest incidence of *Salmonella* contamination (41 and 48 per cent). It may be observed, however, that not only were fewer plants located in the North Atlantic, South Atlantic, and Western divisions, but also fewer samples of powder were examined from

these areas. The findings, therefore, do not adequately reflect the quality of the eggs processed or the operations of plants located in these divisions.

*Incidence, by Age of Samples*—The number and percentage of *Salmonella*-positive samples are arranged in Table 5 according to the age (in days) of the samples. No appreciable effect of age, up through 17 days, on the incidence of *Salmonella* could be observed. Of 124

TABLE 5

*Incidence of Salmonella in Spray-dried Whole Egg Powder, According to Age of Samples*

Age (days)	Number samples examined	Samples positive for Salmonella	
		No.	%
2	10	1	10.0
3	49	18	36.7
4	164	60	36.6
5	391	136	34.8
6	694	254	36.6
7	822	277	33.7
8	656	238	36.3
9	536	172	32.1
10	442	160	36.2
11	367	113	30.8
12	256	96	37.5
13	183	54	29.5
14	97	21	21.7
15	45	19	42.2
16	54	22	40.7
17	50	19	38.0



samples of powder of various ages between 18 and 43 days, 35 (28 per cent) were positive for *Salmonella*. It would seem, therefore, that death of *Salmonella* organisms in egg powder is slower than might be expected.

### *Salmonella* Type Distribution—Nine-

TABLE 6

*Distribution of Salmonella Types Isolated from Spray-dried Whole Egg Powder*

Type	Number of isolations	Percent of total isolations
pullorum .....	562	28.5
oranienburg .....	370	18.7
montevideo .....	210	10.6
tennessee .....	160	8.1
anatum .....	132	6.7
bareilly .....	73	3.7
typhimurium .....	56	2.8
meleagridis .....	47	2.4
senftenberg .....	37	1.9
newport .....	33	1.7
give .....	29	1.5
london .....	28	1.4
newington .....	28	1.4
derby .....	25	1.3
rubislaw .....	22	1.1
cerro .....	17	0.9
oregon .....	17	0.9
worthington .....	16	0.8
minnesota .....	10	0.5
urbana .....	7	0.4
paratyphi B.....	7	0.4
javiana .....	7	0.4
bredeney .....	7	0.4
thompson .....	7	0.4
kentucky .....	6	0.3
manhattan .....	6	0.3
poona .....	4	0.2
typhimurium var. copenhagen	4	0.2
madelia .....	3	
oslo .....	3	
lexington .....	3	
litchfield .....	3	
georgia .....	3	
california .....	3	
san diego.....	3	
braenderup .....	2	
arechavaleta .....	2	
new brunswick.....	2	
simsbury .....	2	
saint paul.....	1	
budapest .....	1	
choleraesuis var. kunzendorf.	1	
gaminara .....	1	
kottbus .....	1	
muenchen .....	1	
muenster .....	1	
panama .....	1	
paratyphi B. var. odense....	1	
pomona .....	1	
vejle .....	1	
hershham .....	1	
norwich .....	1	
Total.....	1,969	

teen hundred and sixty-nine isolations of *Salmonella* were made from 1,810 positive powder samples. These isolations yielded 52 *Salmonella* types, which are listed in Table 6 according to frequency of distribution. Five types, *S. pullorum*, *S. oranienburg*, *S. montevideo*, *S. tennessee*, and *S. anatum*, comprised 73 per cent of the total isolations. The next 10 types in order of frequency comprised 19 per cent of the total isolations, and the remaining 37 types 8 per cent.

The numbers of *Salmonella* isolations and types in each antigenic group are given in Table 7. The largest number of isolations, 829 (42 per cent), were members of the C<sub>1</sub> group, the next largest number, 570 (29 per cent), were members of the D group, followed by groups E<sub>1</sub>, B, C<sub>2</sub>, E<sub>2</sub>, E<sub>3</sub> and F (further groups), respectively. The number in the B group was surprisingly low. Although *S. typhimurium* was the most commonly isolated member of this group, it was only seventh in the frequency distribution of the types isolated from egg powder (Table 6). Ninety-five per cent of the isolations fell within the 5 basic antigenic groups (B, C<sub>1</sub>, C<sub>2</sub>, D, E).

In Table 8 the distribution of *Salmonella* types isolated from spray-dried whole egg with a high moisture content in this study and from egg and egg products in field studies<sup>6</sup> is compared with

TABLE 7

*Frequency of Isolation of Salmonella Types from Spray-dried Whole Egg Powder, Tabulated by Antigenic Groups*

Antigenic group	Number of types isolated	Number of isolations	Percent of total isolations
B	11	110	5.6
C <sub>1</sub>	9	829	42.1
C <sub>2</sub>	6	61	3.1
D	3	570	28.9
E <sub>1</sub>	7	241	12.2
E <sub>2</sub>	2	30	1.5
E <sub>3</sub>	2	39	2.0
F*	12	89	4.5
Total	52	1,969	

\*F = Further groups

the distribution of types found in human, poultry, and animal infections as reported by Edwards and Bruner<sup>7</sup> and Seligmann, Saphra, and Wassermann.<sup>1</sup> Edwards and Bruner's survey was based on the analyses of 3,090 cultures of *Salmonella* isolated from 2,285 outbreaks in man, poultry, and animals in the United States between 1934 and 1941. Seligmann, Saphra, and Wassermann analyzed 1,000 cases of human *Salmonella* infections (not including *Salmonella typhi*) identified and studied in the period between 1939 and 1943. With the exception of *Salmonella paratyphi* A, only the *Salmonella* types isolated from spray-dried whole egg in this study (MRD)\* are listed in the table. The frequency of isolation of each type is recorded for egg and non-egg studies. Types found in non-egg studies but not in egg powder have been listed in each group as "others."

Table 8 shows that many of the *Salmonella* types found in egg powder are identical with types isolated from animal, poultry, and human sources. The majority of the types reported in the non-egg studies are among those reported in the dried egg study (MRD), that is, 38 of the 59 types identified at the Lexington Center,† and 26 of the 38 types identified at the New York City Center.‡ It may further be observed that the types isolated with greatest frequency in any one of the studies are in most instances common to the others.

Group A—*S. paratyphi* A, the only type in Group A, was not isolated from egg powder. Presumably it is one of the few types which have exhibited a greater adaptation for the human host. Aside from *S. typhi*, the majority of the types in the other groups usually give rise to

gastroenteritis (food poisoning), but as Seligmann, *et al.*<sup>1</sup> have stated "every *Salmonella* is potentially capable of producing every one of these groups of clinical processes," that is, gastroenteritis, localized processes, typhoid-like symptoms, and symptoms of septicemia without localizing signs, fatalities, and the asymptomatic carrier state.

Group B—Five per cent of the isolations from egg powder (MRD) belonged to Group B. *S. typhimurium* was the most frequently encountered of the 11 types within this group and made up 3 per cent of the identified cultures. *S. typhimurium* was the only member of Group B reported in Canadian egg powder.<sup>2</sup> Group B isolations were considerably higher in the non-egg studies, 43 per cent and 49 per cent, respectively. Again, *S. typhimurium* was largely responsible for these high percentages. It made up 27 per cent of the Lexington Center's isolations<sup>7</sup> and 37 per cent of the New York City Center's isolations.<sup>1</sup> *S. derby* and *S. paratyphi* B were also isolated more frequently from animals, poultry, and humans than from egg powder.<sup>7, 1</sup>

Group C ( $C_1 + C_2$ )—Approximately 45 per cent of the typed cultures from egg powder (MRD) belonged to the C group. This is the major group in so far as the dried egg findings are concerned. Although 16 types were identified, 5 types—*S. oranienburg*, *S. montevideo*, *S. tennessee*, and *S. bareilly* of subgroup  $C_1$  and *S. newport* of subgroup  $C_2$ —comprised 43 per cent of the identified cultures. The relatively high distribution of these 5 types in the Lexington survey may probably be explained by the fact that it included numerous isolations from poultry and animals. With the exception of *S. newport*, they were less frequently encountered in man. *S. newport* was encountered in 3 and 9 per cent of the isolations in both non-egg studies. *S. choleraesuis* and *S. choleraesuis* var. *kunzendorf* were isolated with

\* MRD = Microbiology Research Division.

† Lexington, Ky., *Salmonella* Typing Center. Kentucky Agricultural Experiment Station. Dr. P. R. Edwards, Director.

‡ New York City *Salmonella* Typing Center. Beth Israel Hospital. Dr. E. Seligmann, Director.

TABLE 8

*Comparative Frequency Distribution of Salmonella Types from Spray-dried Whole Egg Powder and from Animal, Poultry, and Human Sources*

Group	Type	Soloway, McFarlane, Solowey Gibbons Spaulding Spaulding & & Chamerda Goresline <sup>3</sup> Moore <sup>2</sup>			Edwards and Bruner <sup>7</sup>		Seligmann Saphra and Wassermann <sup>1</sup>	
		Spray- dried whole egg powder	Shell, liquid and spray- dried whole egg powder	Spray- dried whole egg powder	Animal, poultry, and human infections		Human infections	
		MRD* 1943-1944	Field studies 1944	Canada 1942-1943	Lexington, Ky., Center 1934-1941			New York City Center 1939-1943
					Animal and Poultry	Human	Total	
A	paratyphi A				0	7	7	14
	Per cent†					1.3	0.2	1.4
	typhimurium	56	5	3	789	60	849	369
	derby	25	5		66	4	70	27
	para B	7			6	78	84	87
	bredeney	7			40	8	48	3
	typhimurium var copenhagen	4	2		142	3	145	
	archavaleta	2				1	1	
B	saint paul	1			1	3	4	1
	budapest	1						
	california	3			25	1	26	
	para B var. odense	1						
	san diego	3			4	13	17	1
	others		4		29	56	85	4
	Total	110	16	3	1,102	227	1,329	492
	Per cent†	5.5	5.8	10.0	43.0	42.5	43.0	49.2
	oranienburg	370	117	4	34	18	52	68
	montevideo	210	23		17	24	41	48
	tennessee	160	31			2	2	
	bareilly	73	13	11	59	13	72	18
	oslo	3						
C <sub>1</sub>	thompson	7		2	1	4	5	4
	braenderup	2						
	georgia	3						
	cholerasuis var. kunzendorf	1			301	28	329	90
	others		2	1	29	3	32	3
	Total	829	186	18	441	92	533	231
	Per cent†	42.0	67.2	60.0	17.2	17.3	17.3	23.1
	newport	33		1	32	53	85	93
	oregon	17			7	3	10	
C <sub>2</sub>	manhattan	6		1	5	2	7	1
	litchfield	3			1	2	3	2
	kottbus	1						
	muenchen	1			2		2	10
	others				2	1	3	1
	Total	61		2	49	61	110	107
	Per cent†	3.1		6.6	1.9	11.4	3.6	10.7
D	pullorum	562	49	5	500	2	502	
	javiana	7				2	2	
	panama	1			7	27	34	35
	others				149	38	187	34
	Total	570	49	5	656	69	725	69
	Per cent†	29.1	17.7	16.6	25.6	12.9	23.5	6.9
	anatum	132	4		83	12	95	27
	meleagridis	47	7		18	3	21	4
	give	29	3		33	8	41	13
E <sub>1</sub>	london	28			1		1	3
	lexington	3			1		1	
	muenster	1						
	vejle	1						
	others							
	Total	241	14		136	23	159	47
	Per cent†	12.1	5.1		5.4	4.3	5.2	4.7

TABLE 8—Continued

		Soloway, McFarlane, Spaulding & Chermida	Solowey Spaulding & Goresline <sup>3</sup>	Gibbons and Moore <sup>2</sup>	Edwards and Bruner <sup>7</sup>		Seligmann Saphra and Wassermann <sup>1</sup>
		Spray- dried whole egg powder	Shell, liquid and spray- dried whole egg powder	Spray- dried whole egg powder	Animal, poultry, and human infections		Human infections
		Lexington, Ky., Center 1934-1941					New York City Center 1939-1943
Group	Type	MRD* 1943-1944	Field studies 1944	Canada 1942-1943	Animal and Poultry	Human	Total
E <sub>2</sub>	newington	28			28	37	65
	new brunswick	2			43		43
	others				7		7
	Total	30			78	37	115
	Per cent†	1.5			3.1	6.9	3.7
E <sub>3</sub>	senftenberg	37			48	11	59
	simsbury	2				1	1
	others						
	Total	39			48	12	60
	Per cent†	2.0			1.9	2.3	1.9
F	rubislaw	22			1		1
	cerro	17	2		2		2
	worthington	16	3		21	2	23
	minnesota	10	1	2	5		5
	urbana	7			2		2
	kentucky	6	4		6	2	8
	poona	4					
	madelia	3					
	gaminara	1					
	pomona	1					
	horsham	1					
	norwich	1					
	others				10	1	11
	Total	89	10	2	47	5	52
	Per cent†	4.5	3.6	6.6	1.8	0.9	1.7
Grand total							
Identified		1,969	277	30	2,557	533	3,090
No. of types		52	18	11			59
No. of types in common with Dried Whole Egg		52	16	10			38
Unidentified		6					

\*MRD = Microbiology Research Division.

†Per cent of total isolations.

great frequency only in the non-egg studies.

Group D—Three D types made up 29 per cent of the dried egg isolations (MRD). The D group, which is the second largest for dried eggs, owes its size to the number of isolations of *S. pullorum*. A similarly large percentage for this group (24 per cent) was reported in the Lexington survey. *S. pullorum* owes its prominence in the dried egg and Lexington studies to the fact that it is primarily a poultry pathogen. It has

been encountered in man, however.<sup>7-9</sup> The total D isolations for the New York City Center was 7 per cent, a figure decidedly lower than that reported for the other studies.

Group E ( $E_1 + E_2 + E_3$ )—Sixteen per cent of the dried egg isolations (MRD), comprising 11 types, belonged to group E. Distribution reported for the Lexington and New York City Centers was 11 and 6 per cent, respectively.

Group F—Approximately 5 per cent of the dried egg isolations (MRD). com-

prising 12 types, belonged to group F. Distribution reported for the Lexington and New York City Centers was 2 and 3 per cent, respectively.

The distributions in the B, C, D, E, and F groups of the *Salmonella* isolated by Gibbons and Moore<sup>2</sup> and by Solowey, *et al.*<sup>6</sup> during field studies correspond closely with the distribution found in powder having a high moisture content (Tables 7 and 8).

#### DISCUSSION

The investigation reported here has been of necessity limited to a qualitative study of the incidence, types, and distribution of *Salmonella* found in spray-dried whole egg. Nevertheless, it has brought out evidence that the *Salmonella* types isolated from egg powder have the same morphological and cultural characteristics and give the same biochemical and serological reactions as types isolated from infected humans.<sup>2, 9, 10-13</sup> It should be kept in mind, however, that the methods used for the isolation of *Salmonella* from egg powder were not radically different from methods employed for *Salmonella* isolation from other sources. Although three selective media were used in the isolation of *Salmonella*, bismuth sulfite agar was as satisfactory as SS agar for the various *Salmonella* types, and apparently better for the isolation of *S. pullorum*. Most of the latter were isolated from bismuth sulfite agar.

The *Salmonella* contaminations reached a peak during the summer. This is in line with general information concerning the poorer quality of shell eggs marketed during this time of year. The fact that the percentages of samples contaminated during the fall were also high may be attributed, in part at least, to the use of frozen and storage shell egg liquid obtained from substandard shell eggs and/or from improperly frozen and improperly stored summer surpluses of shell eggs.

It is difficult to assess the significance of such factors as temperature, humidity, and type of soil in establishing a causal relationship with *Salmonella* contamination. Very little is known concerning the source and quality of the raw material used by the individual plants or the relative effects of different processing methods on microbial destruction. Actually, some of the plants whose samples showed a high incidence of contamination were located in areas characterized by high temperature, high total precipitation, and specific kinds of soils. However, it is not possible to attribute with exactitude the high incidence of contamination to the environmental factors cited. In order to evaluate the facts, more complete histories than those hitherto given must be made available with the samples to be examined.

The dangers arising from the consumption of raw and incompletely cooked duck eggs are well known and accepted. Adequate proof that hens' eggs may be similarly infected is still lacking. A recent direct accusation of hens' eggs in this country has been made by Watt.<sup>14</sup> He investigated an outbreak of salmonellosis (*S. montevideo*) aboard a merchant vessel which affected 28 individuals in a crew of 70. "Epidemiological evidence indicated that infection resulted from the consumption of contaminated egg salad, the mayonnaise of which contained raw eggs. The same *Salmonella* type, *S. montevideo*, was isolated from two cases of shell eggs obtained on the ship. Internal contamination of the eggs was demonstrated, since the shell washings before sterilization were free of *S. montevideo*, and egg meats obtained after sterilization of shells were found to contain this organism."

*S. pullorum* is one of the types hitherto ignored to some extent in egg products for human consumption because it has always been assumed to be non-pathogenic for man. In the last

few years, however, it has been isolated from infected human beings.<sup>7-9</sup> The presence of *S. pullorum* in cases of gastroenteritis is probably more widespread than is realized, but because of its fastidious growth requirements and slightly different morphological characteristics on selective media, it is not isolated from infected material with the same facility as other members of the *Salmonella* group.

There is no evidence in the data that any *Salmonella* type occurs more frequently in powder produced in one locality in the United States than in any other. Moreover, there is no evidence that any *Salmonella* type is specific to egg powder. On the other hand, the percentages of the types within the major groups appear to be different from those found for the other frequency distributions cited. It may be reasonably assumed that a similar distribution might be encountered only in the examination of poultry and poultry products.

Borman pointed out that the "number of *Salmonella* types that occur exclusively in man or animals is diminishing." This statement has been amply confirmed by the investigators cited. The pathogenicity of the strains isolated from dried egg is as yet undetermined. Various arguments have been set forth that (1) the organisms may be present in too few numbers to initiate infection, (2) they may have been attenuated by heat, and (3) contaminated powder has not been cited in the literature as a cause of *Salmonella* infections. Nevertheless, although the validity of these statements is admitted, the presence of *Salmonella* organisms in this food product constitutes a potential hazard, especially with respect to the treatment of reconstituted powder.

The presence of such a wide variety of *Salmonella* types in spray-dried whole egg powder is evidence *per se* that the drying process as utilized in the manu-

facture of high moisture (4-6 per cent) powder does not destroy the organisms. That powder of low moisture content (not exceeding 2 per cent) still contains *Salmonella* is indicated in the work of Schneider<sup>15, 16</sup> who reported the isolation of five *Salmonella* types, *S. pullorum*, *S. oranienburg*, *S. tennessee*, *S. oregon*, and *S. montevidео*, from samples of such powder. Our own investigations of low-moisture powder (unpublished data) indicate that *Salmonella* are not entirely eliminated.

#### SUMMARY

*Salmonella* were isolated from 35 per cent of 5,198 samples of spray-dried whole egg powder obtained from 100 dehydration plants between September, 1943, and January, 1945. Incidence of *Salmonella* in samples examined from individual plants ranged from 0 to 71 per cent. Fifty-two *Salmonella* types were identified, five of which, *S. pullorum*, *S. oranienburg*, *S. montevidео*, *S. tennessee*, and *S. anatum*, made up 73 per cent of the isolations. Culturally, morphologically, biochemically, and serologically the 52 types are in every way similar to those isolated from human beings and animals. The types that occur with greater frequency in dried eggs are among those that commonly occur in human and animal infections. The frequency distribution of the *Salmonella* types isolated from dried eggs is not the same as that of the types isolated from human beings.

ACKNOWLEDGMENT—The authors wish to acknowledge the technical assistance of Robert I. Ferlauto, Lillian Kraekel, Elizabeth G. Naghski, Aaron Rosenstadt, and Marion E. Wilson, Microbiology Research Division, Bureau of Agricultural and Industrial Chemistry, U. S. Department of Agriculture.

#### REFERENCES

1. Seligmann, E., Saphra, I., and Wassermann, M. *Salmonella* Infections in Man. *Am. J. Hyg.*, 38:226-249, 1943.
2. Gibbons, N. E., and Moore, R. L. Dried Whole Egg Powder. XI Occurrence and Distribution of

Salmonella Organisms in Canadian Powder. *Canad. J. Research*, F, 22:48-57, 1944.

3. McFarlane, V. H., Watson, A. J., Sutton, R. R., and Kurman, William. Microbiology of Spray-Dried Whole Egg. I. Plate and Direct Counts. *Food Research*, \_\_\_\_\_.

4. Edwards, P. R., and Bruner, D. W. Serological Identification of Salmonella Cultures. Univ. Kentucky Agr. Exp. Sta. Circ. 54. 1942.

5. Kauffmann, F. *Die Bakteriologie der Salmonella-Gruppe*. Copenhagen: Einar Munksgaard, 1941.

6. Solowey, M., Spaulding, E. H., and Goresline, H. E. An Investigation of a Source and Mode of Entry of Salmonella Organisms in Spray-dried Whole Egg Powder. *Food Research*, 11:380-390, 1946.

7. Edwards, P. R., and Bruner, D. W. The Occurrence and Distribution of Salmonella Types in the United States. *J. Infect. Dis.*, 72:58-67, 1943.

8. Felsenfeld, O., and Young, V. M. The Occurrence of Members of the Genus Salmonella in Inhabitants of State Hospitals of the Greater Chicago Area. *J. Lab. & Clin. Med.*, 29, 4:375-382, 1944.

9. Edwards, P. R. Incidence of Salmonella Types in Fowls in the U. S. *Proc. 7th World's Poultry*

*Congress and Exposition. Cleveland, Ohio, July 28-August 7, 1939*, pp. 271-274.

10. Borman, E. K., Wheeler, K. M., West, D. E., and Mickle, F. L. Salmonella Typing in a Public Health Laboratory. *A.J.P.H.*, 33, 2:127-134, 1943.

11. Jungherr, E. Paratyphoid Infections in Birds. *Vet. Med.*, 35:112-116, 1940.

12. Hinshaw, W. R., McNeil, E., and Taylor, T. J. Avian Salmonellosis. Types of Salmonella Isolated and Their Relation to Public Health. *Am. J. Hyg.*, 40:264-278, 1944.

13. Bornstein, S. The State of the Salmonella Problem. *J. Immunol.*, 46:439-496, 1943.

14. Watt, J. An Outbreak of Salmonella Infection in Man from Infected Chicken Eggs. *Pub. Health Rep.*, 60:835-839, 1945.

15. Schneider, M. Isolation of *S. tennessce* from Frozen Whole and Powdered Egg. *Bull. U. S. Army Med. Dept.*, 4:477 (Oct.), 1945.

16. Schneider, M. Investigation of Salmonella Content of Powdered Whole Egg With Not More Than Two Per cent Moisture Content. II. General Survey and Occurrence of Species of Salmonella in High Quality Egg Powder. *Food Research*, 11:313-318, 1946.

## Proposed National Heart Disease Institute

On June 9, Congressman Javits of New York, introduced a bill in the United States Congress providing for the creation of a National Heart Disease Institute within the U. S. Public Health Service. Such an institute would provide for research and the development of more effective methods of prevention, diagnosis, and treatment of the diseases

of the heart and circulation. The bill was referred to the Committee on Interstate and Foreign Commerce.

The Board of Directors of the American Heart Association unanimously approved the bill at a meeting held in conjunction with the 23rd annual meeting of the Association in Atlantic City in June.

# Shellfish\*

## Engineering Section

THE Shellfish Committee of the Engineering Section met in New York City on the morning of June 4, 1946. A joint luncheon and afternoon meeting was held on this same date with the Committee on Standard Methods for the Examination of Shellfish. This was the first meeting of the committee in two years, because of travel restrictions in 1945.

Since the time of the last meeting the Public Health Service has adopted and placed in operation the new *Manual of Recommended Practice for the Sanitary Control of the Shellfish Industry*. Much of the discussion at the 1946 meeting therefore had to do with this *Manual*. In reporting on these subjects the same order will be followed as that occurring in the *Manual*. Reference numbers where used refer to *Manual* numbers. In addition to the discussion of the *Manual* some other subjects were considered. These included recent food and drug activities and some new developments within the industry.

### U. S. PUBLIC HEALTH SERVICE MANUAL OF RECOMMENDED PRACTICE FOR THE SANITARY CONTROL OF THE SHELLFISH INDUSTRY

*Definitions* (1)—The committee was of the opinion that in view of the rapid development of some quick frozen foods, using raw or partially cooked shellfish, the definition of "shellfish" appearing on page 5 should be revised. It is

recommended that this definition be changed to read as follows:

*Shellfish*: Shellfish means all fresh or frozen oysters, clams, or mussels either shucked or in the shell, and any fresh or frozen or incompletely sterilized edible products thereof.

It is apparent from the above recommendation that the committee believes that the frozen food industry handling shellfish products should be under the same sanitary supervision and control as the fresh or unprocessed shellfish industry. Processed or canned shellfish, where the processing or canning results in a sterile product, have always been exempt from the control of the Public Health Service and are the responsibility of the Food and Drug Administration. Likewise, where frozen foods contain completely processed or sterilized shellfish products before freezing, such frozen foods will become exclusively the responsibility of the Food and Drug Administration. The Public Health Service and the State Regulatory Authorities responsible for fresh shellfish sanitation will, however, be responsible for frozen foods containing raw or partially cooked shellfish.

### BACTERIOLOGICAL EXAMINATION OF SHELLFISH AND SHELLFISH WATERS

(3.3)—As indicated in the opening paragraph, the Engineering committee met jointly with the Laboratory committee to consider some problems com-

\* Progress Report of the Committee on Shellfish.  
Committee on SHELLFISH (Engineering Section)

Organized 1928. Published reports: *Year Books* 1934-1935, 1935-1936, 1936-1937, 1937-1938, 1938-1939, 1939-1940, 1940-1941, *A.J.P.H.*, July, 1941, July, 1945



mon to both. During the morning the Laboratory committee had held a separate meeting. It is believed that some revisions in the recently adopted "Standard Methods" for the examination of shellfish and shellfish waters are contemplated as a result of these meetings. Basically, however, the methods will remain unchanged. It was the opinion of the joint committees, however, that the limiting standards set forth in the *Manual* were not satisfactory and should be changed as quickly as possible. No conclusions could be reached at the June meetings as to how they should be changed.

This matter of satisfactory and suitable limiting standards for the sanitary quality of shellfish and shellfish waters has always been a troublesome problem. There seems to be a general agreement on the limiting bacteriological standards for the quality of shellfish waters, although even this is not unanimous. But when the question of limiting bacteriological standards for shellfish is considered, there seems to be little if any agreement. Now, with the added problem of setting up practical standards for frozen shellfish and shellfish products, the question of standards becomes even more complex. The joint committees realize the extent of this problem and have decided to meet again in Cleveland for further discussion of this particular subject. It is hoped that out of this meeting there will be developed some reasonable, practicable and much needed bacteriological standards for the shellfish industry.

*Cleansing* (4.2)—Although this subject was not discussed at the meeting, nevertheless it is desirable that the committee carefully consider recent developments by the Fish and Wildlife Service which indicate that some of our former concepts on this subject may be in need of revision. This may also be true in the case of *Floating* (4.5).

*Bactericidal Treatment* (4.21)—It is

often difficult to get a sufficient supply of hot water or live steam in shucking and packing plants to insure sterilization of equipment. Recently a new piece of equipment has been tried to overcome this difficulty. This equipment is used extensively in garages for cleaning motors. It is a kerosene burner that produces an almost instantaneous and continuous stream of steam under pressure. The machine is small, compact, and portable. It requires only connections to a water supply and an electric outlet. Various lengths of steam hose and several types of nozzles come with the machine. Final tests of the efficiency of this machine have not yet been made, but its use under certain conditions seems promising.

*Shipping Containers* (4.29) — The post-war development of air transport for shellfish and the expanded frozen food activities will bring about new and as yet untried shipping containers. Some firms have already been experimenting with pliofilm packages. In any event the more extensive use of individual consumer packages appears to be in the offing. The committee welcomes this development and believes it should encourage the use of such packages in the interest of giving the consumer better shellfish.

The proper identification of such consumer packages containing fresh or frozen shellfish does not seem to be fully covered in the *Manual*. It is the committee's recommendation that such packages should show clearly on their labels the following information:

1. The name and address of the packer or distributor.
2. A statement of the true contents of the package.
3. The certificate number of the shucker or packer, preceded by state abbreviations.
4. The date of packing. This may be in code and such a coding should have some reference to the lot packed which would show upon examination of the records of the packer the source of such shellfish and date shucked.

*Packing and Shipping Shell Stock* (4.39)—In the mussel producing areas some difficulty has been experienced in obtaining a satisfactory shipping container. The use of burlap bags commonly used in the shipment of other types of shellfish is unsatisfactory for mussels. Mussels begin to drain rapidly soon after removal from the water and this drainage is soaked up by such bags resulting in increased growths of bacteria which are in turn further drained into lower layers of the mussels. Mussels showing satisfactory concentrations of bacteria when taken from good areas are therefore quite often found to contain excessive bacteria when they reach the market. This is particularly true in warm weather. It is recommended that the use of such bags in the shipment of mussels be prohibited.

*Identification of Shell Stock on the Market* (4.40)—As required in the *Manual*, shell stock should bear a tag on each container showing:

1. The name and address of the shipper with his state certificate number preceded by the state abbreviation.
2. The name and address of the consignee.
3. A statement of the kind and quantity of shellfish in the container.
4. The date of shipment, coded or un-coded.

In addition to these items the committee believes such tags should show the *source* of such shellfish. This information should be tied down to as small an area as possible.

#### NEW MACHINES FOR SHUCKING OYSTERS

During the meetings of the committee and the later meetings of the Oyster Institute, demonstrations were given of two recently developed machines for the mechanical opening of oysters. One of these machines shears the adductor muscle from one shell and leaves the oyster attached to the other shell. The second machine operates very much the same as the mechanical potato peeler.

It would not seem that either machine at this stage of development could replace the hand opening in commercial shucking plants, but the shearing machine might be useful in opening oysters for laboratory examination. Either machine would be helpful in the opening of oysters in restaurants for half shell trade.

#### PROCESSED OR CANNED SHELLFISH

Although the Public Health Service is not concerned with processed or canned shellfish because these products come under the Food and Drug Administration, nevertheless, the committee believes that only shellfish of good sanitary quality should be used in such packages. It is desirable to have such containers bear some lot or code number which would permit the tracing of their contents to their origin.

#### USE OF SHELL LIQUOR

From time to time attempts have been made by some packers to save and process or sell shell liquor drained from shellfish during the opening process. The committee is of the opinion that while such a practice might meet the requirements of the *Manual*, it is more than likely it would not and therefore it should be discouraged. If, however, such a practice is undertaken it is thought that the Food and Drug Administration must define its limitations. In such cases consideration should also be given to the pasteurization of such liquors.

#### FOOD AND DRUG ADMINISTRATION

Activities of the Food and Drug Administration were outlined for the committees by Glen D. Slocum with particular reference to the proposed establishment of standards of identity. These standards are being established for the purpose of:

1. Decreasing to a minimum the time the shellfish are in contact with fresh water.

2. Assuring adequate drainage after washing.
3. Obtaining uniform sizes for consumer protection.

It will be noted that such standards of identity have already been established and go into effect on January 1, 1947.

#### IMPORTATION OF SHELLFISH

Although the listing of Canadian shippers by the U. S. Public Health Service was discontinued some years ago there has been no satisfactory substitute provided by any federal agency. Many foreign countries are trying to ship shellfish into this country, and there fails to exist today any legal means for accepting such shipments other than the "after arrival" procedure of the Food and Drug Administration. From a public health point of view such a procedure is unsatisfactory. The committee recommends that the Public Health Service investigate the possibility of once more arranging for the listing of the shippers of such countries as may carry out a control program at the source of supply comparable with our program in this country. It has been suggested that such a program might become a function of the World Health Organization.

#### SCORE SHEETS

The committee believes that a satisfactory score sheet for the evaluation of both shellfish plants and state control measures has not yet been developed, and would welcome suggested sheets for future consideration.

#### GENERAL COMMITTEE RECOMMENDATION

The committee endorses the new Public Health Service *Manual* in principle

and recommends that the Public Health Service extend, if possible, its shellfish sanitation program along three principal lines of endeavor as follows:

1. Provide for a full-time sanitary engineer to engage in shellfish sanitation work in each district.
2. Provide for continuous research and technical study of shellfish sanitation problems.
3. Stimulate or carry out some effective educational program in the consuming areas for the purpose of eliminating unsatisfactory practices, particularly on the part of retailers.

#### ADDENDUM

The joint committee meeting took place in Cleveland on November 11, 1946. The following were agreed upon:

1. That within the limits of our present knowledge the procedure outlined in the *Manual* for determining classes of shellfish areas based on sanitary surveys and coliform results is generally satisfactory.
2. That any recommended changes in limiting bacteriological standards for shellfish or shellfish products must be based on factual data.
3. That such factual data are not available and, consequently, no changes are now being recommended for shellfish standards although the committees believe that the shellfish standards now appearing in the *Manual* are inadequate and must be revised as soon as factual data permit.

M. H. BIDWELL, *Chairman*  
L. M. CLARKSON  
L. M. FISHER  
JOSEPH B. GLANCY  
RICHARD MESSER  
JOHN H. O'NEIL  
SOL PINCUS  
KENNETH H. SPIES  
EDWARD WRIGHT

*Adviser, Laboratory Section*  
CHESTER T. BUTTERFIELD

# Cheese and Its Relation to Disease\*

F. W. FABIAN, PH.D., F.A.P.H.A.

*Professor of Bacteriology and Public Health, Department of Bacteriology and Public Health, Michigan State College, East Lansing, Mich.*

CHEESE is a standard item of diet and rates very high among foods from a nutritive standpoint. It is therefore important that it should be surrounded with all the necessary sanitary safeguards to insure a product free of disease germs. Cheese like other dairy products such as ice cream and butter does not receive the attention from public health officials that it merits. However, the long list of epidemics of disease traced to it<sup>12</sup> within recent years has awakened those responsible for the health of the people to the need of sanitary regulations governing its manufacture and sale.

## EPIDEMICS TRACED TO CHEESE

A list of epidemics traced to cheese since 1883 has been compiled from the literature and various other sources and is presented in Table 1. A summary of these data shows that during this time there has been a total of 59 epidemics with 2,904 cases of disease and 117 deaths. While this total is sufficiently impressive to convince even the most skeptical, there is every reason to believe that this represents only a fraction of the total. After the epidemics reported by Baker<sup>1</sup> in Michigan during 1883-1884, there were no more epidemics recorded until 1893, after which there was a lapse of 21 years before

another epidemic was reported. Thereafter, only an occasional epidemic due to cheese was reported in the literature until 1932 when the big epidemic occurred in Quebec with 627 cases and 57 deaths. This epidemic seems to have made public health officials conscious of the fact that cheese may be an important vehicle for the transmission of disease, and from that time on we find one or more epidemics reported each year except in 1933.

From 1935 to 1945, 40 epidemics were reported involving 1,741 cases and 47 deaths, which is over twice as many epidemics as the 19 which were reported in the previous 42 years. Such figures as these lead one to suspect strongly that during this time cheese had been overlooked as a source of disease.

While no attempt has been made to make a thorough search of the foreign literature for epidemics due to cheese, a partial list of such epidemics is recorded in Table 2. From 1901 to 1944 inclusive, 16 epidemics involving 526 cases and 2 deaths have been tabulated.

An analysis of the data in Table 1 shows that the most frequently reported disease is food poisoning which accounted for 35, or 61 per cent, of the 59 epidemics with 1,389 cases, or 47.9 per cent of the total 2,904 cases reported. Next in order comes typhoid fever with 16, or 27 per cent of the total number of epidemics. Although typhoid fever was responsible for only 27 per cent of the epidemics, it accounted for 1,354, or 46.6 per cent of the total

\* Presented before the Laboratory Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 13, 1946.

TABLE 1  
Outbreaks of Disease Traced to Cheese in the United States and Canada from 1883 to 1946

Disease	Place	Date	Cases	Deaths	Kind of Cheese	Reference	Remarks
Food poisoning	Hubbardston and Oxford, Mich.	Aug., 1883	14-15	0	Cheddar	Baker <sup>1</sup>	Cheese made in Ohio.
Food poisoning	Middleville, Mich.	May, 1884	50-60	—	"	Baker <sup>1</sup>	New cheese made by Horton at Fruitville, Mich.
Food poisoning	Jerome, Mich.	June, 1884	24+	—	"	Baker <sup>1</sup>	" " " " " "
Food poisoning	Jonasville, Mich.	June, 1884	10	—	"	Baker <sup>1</sup>	" " " " " "
Food poisoning	Flint, Mich.	June, 1884	4	—	"	Baker <sup>1</sup>	Cheese believed made at Clio, Mich.
Food poisoning	Big Rapids, Mich.	July 1, 1884	30	—	"	Baker <sup>1</sup>	Cheese made at one of the factories of Horton.
Food poisoning	Carson City, Mich.	July 8-9, 1884	13	—	"	Baker <sup>1</sup>	Cheese made by Horton at Fruitville, Mich.
Food poisoning	Lowell, Mich.	Aug. 28, 1884	13	—	"	Baker <sup>1</sup>	Origin of Cheese not determined.
Food poisoning	Mansfield, Ohio	1893	Many cases	—	Cheese	Reed <sup>21</sup>	Tyrotovicon. Spoiled milk used for making cheese. Also two sick cows found among those supplying the milk.
Botulism	New York State	Oct., 1911	3	3	Cottage (homemade)	Nevin & Mann <sup>21</sup> Also Nevin <sup>20</sup>	Organisms and their filtrates toxic to mice, guinea pigs and rabbits.
Food poisoning	Kalamazoo, Mich.	June 20, 1916	6	—	Cheddar	Levine <sup>24</sup>	Coliform organism but poison was soluble and thermostable.
Typhoid fever	Bath township, Mich.	1917	51	4	"	Rich <sup>27</sup>	Cheese made at Chesaning, Mich., sold 9 to 30 days after it was made. Believed to be due to a typhoid carrier on farm.
Typhoid fever	4 counties	Feb., Mar., Apr., 1925	29	4	"	Wade & Shore <sup>21</sup>	Infection came from cheese made at Cooperative Creamery. Cheese sold 10 days after milking. Typhoid carrier on farm delivering milk to creamery.
Food poisoning	Bedford, Me.	1925	9	0	Albanian cheese	Linden, Turner & Thom <sup>21</sup>	Large numbers of cocci present. Cultured organisms when fed to rats produced diarrhea within 4 hours.
Food poisoning	Kansas City	1926	22	0	Cheddar	Linden, Turner & Thom <sup>21</sup>	Large numbers of cocci present which were morphologically and culturally similar to those isolated from the Albanian cheese.
Food poisoning	U.S.S. Ruben James	1926	20 40	0	Cheese	Thomas & Carl <sup>49</sup>	Cheese part of 1,400 lb. lot procured in New York City. No evidence of Salmonella group.
Food poisoning	Apparently Ontario	1929	130+	0	Probably cheese	Hardman & McKinnon <sup>21</sup>	Outbreak believed to have been due to cheese served at church social. Others who had eaten of same cheese purchased at grocers became ill.
Typhoid fever	St. Maurice Valley, Que.	1932	627	57	Canadian cheese	Foley <sup>14</sup>	Cheese made from unpasteurized milk which was taken from several producers in whose families there were cases of typhoid fever.

## CHEESE

Disease	Locality	Year	No. of cases	No. of deaths	Cottage cheese	U.S.P.H. <sup>50</sup>	Cottage cheese made from raw milk.
Typhoid fever	Parkersburg, W. Va.	1931	24	51	Wisconsin cheese	Dunderson <sup>6</sup> Also U.S.P.H. <sup>50</sup>	Green producing colonies of streptococci which were slightly hemolytic were reported by the laboratory. Women who had eaten the cheese in the town where it was manufactured also were ill. "Gastroenteritis was no doubt due to saprophytic organisms rather than dysentery bacilli." Cheese made from pasteurized milk.
Food poisoning	Chicago, Ill.	1935	0	0			
Gastroenteritis	Whiting, Ind.	1935	8	0	Cream cheese	McCarthy <sup>23</sup>	
Food poisoning	Idaho	1935	12	0	Cheddar	U.S.P.H. <sup>50</sup>	
Typhoid fever	Thorsby, Calgary, Edmonton, Can.	1936	22	4	.....	Bow <sup>3</sup>	Staphylococcus albus isolated. Cheese made from raw and pasteurized milk. Unpasteurized cream Staphylococcus aureus isolated.
Food poisoning	Mapleton, Minn.	1937	37	0	Cottage	U.S.P.H. <sup>50</sup>	
Food poisoning	Sunnyside, Wash. Chicago, Ill.	1937	6	0	Cheddar	U.S.P.H. <sup>50</sup>	
Diarrhea	Chicago, Ill.	1937	11	0	Imported Romano	U.S.P.H. <sup>50</sup>	
Typhoid fever	Thorsby, Alberta, Can.	1938	24	0	Imported Pecorina	U.S.P.H. <sup>50</sup>	Raw milk used in making cheese. Fecal contamination present. Tyrotoxin suspected. A case of botulism. Cheese prepared June 5 to 8 and consumed by 3 persons June 9 and 10. 225 persons ate cheese from local factory at church supper. Estimated that 500-700 persons ate cheese from same factory and from 100-200 became ill. Staphylococcus aureus. Cheese made from raw milk. Cheese was not aged.
Food poisoning	Meridian, Idaho	1938	8	0	.....	Bow <sup>3</sup>	
Botulism	Sheldon, N. Y.	1939	17	0	Cheddar	U.S.P.H. <sup>50</sup>	
Food poisoning	Michigan	1939	3	0	Homemade cooked cheese	N. Y. State Health News <sup>21</sup>	
Food poisoning	Yankton, S. D.	1939	100-200	0	Cheddar	Hardman & McKinnon <sup>21</sup>	Staphylococci and Streptococci present. Made from raw milk and prepared several days before eating. Intestinal disturbance in employee on cheese.
Typhoid fever	Manitoba	1939 to 1940	25+	0	Colby	G. G. Frary <sup>15</sup>	
Food poisoning	San Francisco, Calif.	1939	8	11	Cheddar	Bowman <sup>4</sup>	
Gastroenteritis	Malden, Mass.	1939	21 64	0	"	U.S.P.H. <sup>50</sup>	
Food poisoning	Stenklaus (Co.) Calif.	1940	4	—	Imported cheese	U.S.P.H. <sup>50</sup>	
Food poisoning	Lea, Ill.	1940	10	0	Cottage home-made Mexican style Cheddar Longhorn	U.S.P.H. <sup>50</sup>	

(Cont.)

Disease	Place	Date	Cases	Deaths	Kind of Cheese	Reference	Remarks
Food poisoning	Illinois	1941	10	0	Longhorn	Breed <sup>25</sup>	Probably by employee with intestinal disturbance.
Typhoid fever	Oswego, N. Y. (rural area)	1941	23	1	Cheese curds	Schlesinger <sup>42</sup> Also U.S.P.H. <sup>50</sup>	Cheese made from raw milk. Suspected carrier on dairy farm.
Gastroenteritis	Mt. Holly Twp., N. J.	1942	8	0	Cheddar	U.S.P.H. <sup>50</sup>	Grated cheese.
Food poisoning	Baltimore, Md.	1943	6	0	Munster	U.S.P.H. <sup>50</sup>	Pasteurized cottage cheese.
Food poisoning	Lexington, Ky.	1943	86	0	Cottage	U.S.P.H. <sup>50</sup>	Young unripened cheese. Typhoid carrier.
Typhoid fever	Quebec, Can.	1943	40	6	Cheddar	Gauthier & Foley <sup>17</sup>	Large numbers of coliform group present.
Food poisoning	Baltimore, Md.	1943	40	0	Munster	U.S.P.H. <sup>50</sup>	<i>Proteus morganii</i> isolated also <i>H<sub>2</sub>S</i> producing <i>E. coli</i> .
Food poisoning	Detroit, Mich.	1944	104	0	Cheddar	U.S.P.H. <sup>50</sup>	Onset 45 min. after eating cheese. Two who did not eat it did not become ill.
Food poisoning	Brooklyn, N. Y.	1944	5	0	Roquefort	U.S.P.H. <sup>50</sup>	<i>Staphylococcus aureus</i> .
Gastroenteritis	Roanoke, Va.	1944	71	0	Colby	U.S.P.H. <sup>50</sup>	Unripened. Cheese made from raw milk. <i>E. typhosa</i> , type C.
Typhoid fever	California (9 counties)	1944	80	4	Romano Dolce Teleme	Halverson <sup>20</sup> Also <sup>50</sup>	Unripened. Cheese made from raw milk. <i>E. typhosa</i> , type C.
Typhoid fever	Sparks, Nev.	1944	3	0	"	U.S.P.H. <sup>50</sup>	Unripened. Cheese made from raw milk. <i>E. typhosa</i> , type C.
Typhoid fever	Indiana (16 counties)	1944	246	13	Cheddar	Rice <sup>28</sup>	Unripened, Longhorn, Colby type, poor quality cheddar cheese.
Typhoid fever	Alberta, Can.	1944	83	7	"	Menzies <sup>29</sup> Gershaw <sup>38</sup>	Unripened cheddar cheese, two to four weeks old. Typhoid carrier.
Typhoid fever	Victoriaville, Quebec	1944	29	1	"	C.J.P.H. <sup>27</sup> McCrady <sup>27</sup>	Unripened.
Food poisoning	Boise, Idaho (Garven field)	1944	31	—	Cottage	U.S.P.H. <sup>50</sup>	Cottage cheese suspected. Streptococci other than true lactic type.
Food poisoning	Anderson, Ind.	1945	9	0	Cheese	U.S.P.H. <sup>50</sup>	Made from raw milk and sold without ripening.
Food poisoning	Fulton, Ky.	1945	34	0	Colby	Tucker <sup>40</sup> Wright <sup>63</sup>	Made 3-12-45, caused disease 3-26-45 to 4-2-45.
Food poisoning	St. Francisville, Ill.	1945	250	0	Longhorn Colby Longhorn	Tucker <sup>40</sup> Slevers <sup>45</sup>	Dead mouse found in cheese vat by cheese maker. It was removed and cheese made and sold in Illinois, Kentucky, and Tennessee in less than two weeks.
Food poisoning	Tennessee (6 towns)	1945	250	0	Colby Longhorn	Tucker, et al. <sup>19</sup>	<i>Salmonella typhimurium</i> isolated from cheese.
Typhoid fever	Cornwall, Ontario	1946	10	—	Cheddar	Thompson <sup>46</sup>	Milk from farm where there was a typhoid carrier. Cheese used before 90 day holding period prescribed by law.

number of cases of disease and for 97.4 per cent of the total number of deaths. There were 4 epidemics listed as causing gastroenteritis, 2 as causing diarrhea, and 2 as causing botulism, with a 50 per cent mortality. In the case of typhoid fever there was approximately 1 death for every 12 cases of the disease, which would indicate that the typhoid organism remained viable and virulent in cheese sufficiently long to cause severe infection. In contrast to the high mortality for typhoid fever there was not a single death reported in the 1,389 cases of food poisoning due to cheese, indicating that the organisms responsible for this condition either did not produce a potent toxin or else did not remain viable sufficiently long to cause a severe infection or to produce enough toxin to cause death.

The most recent epidemic of typhoid fever traced to cheese was at Cornwall, Ontario, in January and February, 1946. Since this epidemic has not been reported in the literature, the details as reported by Dr. M. G. Thomson, Medical Health Officer<sup>46</sup> at Cornwall, will be given.

Between 26th January and 25th February, 1946, nineteen cases of typhoid fever occurred in the City of Cornwall and the surrounding suburban area which were traced to two cheeses from one cheese factory and the carrier discovered some weeks later. After the fourth case was reported there was presumptive evidence that cheese purchased in two grocery stores was implicated. It was ascertained that one cheese in each store (which had been already sold so that no sample was available for bacteriological testing) was out, contrary to Dominion of Canada Food Regulations, within the ninety day holding period prescribed by those Regulations. These two cheeses were from the same factory and it soon became necessary to find the carrier who infected the milk which went into those two cheeses. This was simplified owing to a case of typhoid fever occurring in the area supplying milk to the cheese factory in question. The patient had been on a visit to his mother and she was found to be a carrier of typhoid fever. Milk from the farm operated by

this woman had gone into the manufacture of the two cheeses in question which constituted one batch and these were the only cheeses from this factory which had been released to the retail grocers within the ninety day holding period prescribed by the Dominion Government Food Regulations. I may say that on investigating other milk producers whose milk went into the two cheeses in question, no other carriers were found.

I may say that stool specimens from all the possible food handlers in the grocery stores in question were all negative for *E. typhosa* though these tests were repeatedly done.

The organism in all the cases in this outbreak as well as in the stool specimens from the carrier was *E. typhosa*, Type E.

#### HOW TO PREVENT DISEASE FROM CHEESE

Two things stand out when a study is made of the various epidemics caused by cheese. One is that the cheese generally has been made from raw milk and that it has been sold and eaten too quickly after it has been made. Likewise, in the experiments testing the longevity of pathogens in cheese the data show that pathogenic bacteria die out more quickly at high than at low temperatures.\* This leads to the obvious conclusion that all milk and cream used in the manufacture of cheese should be pasteurized and aged at a high temperature. If this were done, the transmission of disease by eating cheese would disappear.

#### PASTEURIZING AND AGING CHEESE

Pioneer work for using pasteurized milk for cheese making was done in 1912 by Sammis and Bruhn<sup>38</sup> in Wisconsin. The following paragraph from their *Research Bulletin 27* is especially significant in view of the many cases of disease traced to cheese since that time:

This process should interest the farmer because of the increased yield of cheese, and the avoidance of the usual losses in yield and quality due to defective milk. It should interest the cheese maker because the process of making is systematized to such a degree that it is conducted upon a fixed schedule for



TABLE 2

## Outbreaks of Disease Traced to Cheese in Other Countries

Disease	Place	Date	Cases	Deaths	Kind of Cheese	Reference	Remarks
Food poisoning	Finbury	Oct., 1901	17	—	Dutch cheese	Newman <sup>22</sup>	Laboratory examination revealed a "poisonous tomatine."
Food poisoning	.....	Nov., 1908	7	—	Cheese	Evans & Aberd <sup>20</sup>	All cases under 17. Cheese said to be new.
Food poisoning	Dover, England	1922	126	—	Canadian Cheddar	McCauley <sup>21</sup>	Organism closely resembled Gaertner group.
Food poisoning	England	1925	9	0	.....	Savage & White <sup>20</sup>	<i>Salmonella subsp. enteritidis</i> .
Paratyphoid B	England	1925	23	—	Italian cream cheese	Graham-Stewart <sup>19</sup>	<i>Salmonella schottmulleri</i> considered cause.
Food poisoning	Utrecht, Holland	1927	—	—	Cheese	Cleyndert <sup>9</sup>	Milk came from dairy affected with "foot and mouth" disease.
Food poisoning	Coblenz, Germany	1928	53	1	Schicht cheese	Reissland and Steinbach <sup>23</sup>	Gaertner's bacillus isolated from animal carcass. Thirteen persons showed positive Widal for Gaertner bacillus with higher agglutination for typhoid bacillus.
Gastroenteritis	Norway	1928	29	0	.....	Blik and Tisdal <sup>2</sup>	<i>Bacterium cholerae suis</i>
Gastroenteritis	Norway	1928	26	0	.....	Blik and Tisdal <sup>2</sup>	<i>Salmonella aertrycke</i> .
Gastroenteritis	Norway	1928	65	1	.....	Schytte and Tisdal <sup>11</sup>	<i>Salmonella aertrycke</i> .
Food poisoning	Bohemos (Prag.)	1935	7	—	Soft	Schubert & David <sup>13</sup>	A species of <i>B. coli</i> implicated.
Food poisoning	Reig prison	1936	100 25 others	0	White cheese	Kathe <sup>21</sup>	Blood of 7 patients agglutinated a hemolytic strain of hemolytic coli in dilutions as high as 1:1,600.
Food poisoning	France	1938	3	—	Pont L'Eveque	Florentin <sup>12</sup>	3 persons in a family of 4 ate the cheese and became ill. The other member who was not ill did not eat the cheese.
Food poisoning	Magdeburg, Germany	1938	28 4 others	—	Limburger	Schade <sup>10</sup>	Strain of <i>B. coli</i> isolated from cheese produced poisonous symptoms in mice.
Brucellosis	Eritrea, Italy	1943	Several	0	Cheese	Cilli <sup>7</sup>	Undulant fever traced to cheese containing <i>Brucella melitensis</i> . Cheese made from cow's, goat's, and sheep's milk.
Food poisoning	Norwich, England	1944	4	0	Goat's milk cheese (homemade)	MacDonald <sup>23</sup>	<i>Staphylococcus aureus</i> isolated from one patient and from freshly drawn goat's milk.

NOTE: Since these tables were compiled, notice of two more epidemics due to cheese has been received from the U. S. Public Health Service as follows:

Food poisoning	Stinesville & Anderson, Ind.	Oct., 1945	9	0	?	Private homes
Food poisoning	Barrio Miraflores Arecibo, P.R.	Mar., 1945	17	1	Native cheese	Raw milk used

all operations. It should interest the dealer because the cheese is more uniform in quality, and there is less need for cold storage for curing. Finally, the cheese should interest the consumer because it is more uniform in flavor than most cheese to be found on the retail counters, being made from pasteurized milk; and it is a more sanitary product than ordinary American cheese made from raw milk.

One of the reasons why cheese makers have resisted pasteurization is because the technique for making cheese from pasteurized milk is somewhat different from making it from raw milk. Rogers and associates worked for years studying and perfecting cheese making from pasteurized milk. This has developed the precision or "clock" method of making cheese from pasteurized milk which includes (a) use of pasteurized milk, (b) controlled starter cultures, and (c) exact timing of each operation in cheese making. They have demonstrated<sup>9</sup> that, contrary to popular belief, it is possible to make a high quality cheese more uniform in flavor from pasteurized milk. In fact they have shown that by using a good grade of milk and cream, pasteurizing and adding a starter, it is possible to age the cheese at a temperature of 60° F. instead of 40 to 50° F. thereby reducing the aging period from 6 to 8 months to 3 to 4 months. Ereks<sup>11</sup> points out that the higher temperature aging period was used for years but discarded because of certain disadvantages.

There are two safety factors in the pasteurized milk process of making cheese: First, pasteurization which is properly done will kill all asporogenic, pathogenic bacteria which have been responsible for so many epidemics and, second, the aging period at the higher temperature. Even though the ripening is for a shorter period of time, the higher temperature will help to kill any pathogens that may have escaped pasteurization or that have gotten into the cheese after pasteurization. All ex-

periments with cheese artificially or naturally seeded with pathogens show that the pathogens die more quickly at the higher than at the lower temperatures.

#### STATE AND CITY LAWS ENACTED

California in 1944 was the first state to pass a law requiring that all cheese sold to the retail trade shall be pasteurized or made from pasteurized cream, milk, or skim milk which has been pasteurized, except cheese which has been allowed to ripen or cure for a minimum period of 60 days. Further requirements are made for labeling the variety, grade, factory number, state of origin, and date of manufacture. This law resulted from an outbreak of typhoid fever caused by green cheese in which there were 79 cases in 9 counties in California and 4 in Nevada.

Colorado likewise passed a similar state law which became effective January 1, 1945, which requires that all cheese shall be pasteurized or made from pasteurized cream, milk, or skim milk, except cheese which has been allowed to ripen for a minimum period of 120 days or longer if deemed necessary. In the same year New York amended the State Sanitary Code to require that Cheddar type cheese be pasteurized or that it be made from pasteurized cream, milk, or skim milk, or had been allowed to ripen at a temperature of not less than 35° F. for a period of not less than 60 days from date of manufacture.

Canada, due to the many outbreaks of disease traced to cheese, passed a regulation which became effective August 1, 1945. This regulation among other things requires:

1. Every manufacturer of cheese by the Cheddar or other process from raw or pasteurized milk that yields a hard-pressed cheese shall mark or brand within 24 hours after removal from the press every merchandising unit of such cheese correctly and distinctly with the date of manufacture indicat-

ing the day, month, and year when such cheese was put into press.

2. No person shall cut any Cheddar or other hard-pressed cheese made from raw or pasteurized milk for sale or consumption as such in Canada within a maturing period of 90 days from the date of manufacture. Throughout the first 10 days of said maturing period of 90 days the temperature of storage shall be maintained at not less than 58° F., and throughout the remainder of the period at not less than 45° F.

Illinois amended a former act regulating the sale of dairy products on May 5, 1945, which became effective January 1, 1946. The amended act requires, among other things, that cheese be made only from pasteurized milk and cream or be ripened or cured for at least 60 days at a temperature not lower than 35° F.

Indiana likewise has amended the regulations regarding the manufacture of cheese to the effect that milk and cream used in its manufacture must be pasteurized or that cheese made from raw milk must be held for at least 60 days before it can be used or sold.

New Jersey likewise has recently passed regulations regarding the manufacture and sale of cheese. They require that cheese be made from pasteurized milk or in lieu of this be held for a period of not less than 60 days before it is used or sold.

Alabama has had a law since 1929 which requires cheese made within the state to be made from pasteurized milk or aged for 60 days before it is sold.

New York City is the only city having a sanitary regulation requiring pasteurization of the milk or holding for a 60 day period. The new regulations became effective December 15, 1944, and briefly are as follows:

1. All kinds of Cheddar and Cheddar type processed cheese must be made from milk or milk products which have been pasteurized, or must be subjected to a heat treatment equivalent to pasteurization. In lieu of pasteurization a minimum of 60 days of aging

after manufacture of these types of cheese is permitted.

2. All soft cheese will be required to be made of pasteurized milk and milk products.

#### UNIFORM SANITARY REQUIREMENTS NEEDED

A committee representing the Wisconsin Cheesemakers' Association, Wisconsin Milk Producers' Association, the University and the State Department of Agriculture of Wisconsin, and the National Cheese Institute framed acceptable minimum sanitary requirements\* for cheese factories and recommended their official adoption by Wisconsin as well as by other states producing cheese.

As Freidel and Yale<sup>16</sup> point out, the cheese industry itself is deeply concerned with proper public health protection for cheese, and feels that all concerned would benefit if all states would adopt uniform regulations. Since cheese is so widely distributed, this would make compliance with state regulations much easier for the industry.

There is a feeling on the part of some health officials that the easiest and best way to obtain uniform sanitary regulations for the 48 states for the manufacture and sale of cheese would be by federal regulations. The establishment of federal standards for interstate shipments of cheese would serve as a model for state regulations and would necessitate a high degree of compliance on the part of cheese manufactures since cheese is so widely distributed.

#### GENERAL DISCUSSION

It would appear from the data presented that the public health officials have neglected to place the proper sanitary safeguards around cheese. During the past 50 years or so there have been no less than 59 recorded outbreaks of disease with 2,904 cases and 117 deaths

\* These requirements may be obtained from Dr. E. W. Gaumnitz, National Cheese Institute, 110 North Franklin St., Chicago, Ill.

in the United States and Canada. Since 1912 when it was first demonstrated that better cheese could be made from pasteurized milk than from raw milk, there have been at least 50 epidemics with 2,715 cases and 117 deaths. Doubtless most of them could have been averted if the knowledge gained at that time had been put into practice. Only recently, due to several large epidemics, have public health officials begun to act and then only in a very limited way. There are today only seven states and Canada that have laws regulating the manufacture and sale of cheese.

All the laws enacted so far have given an alternation between pasteurizing and holding for a definite period during which it is assumed that if any pathogenic bacteria are present, they will die out. The majority have required a 60 day holding period in lieu of pasteurization. This holding period is too short for the Cheddar type hard cheese since many of the pathogens do not die or their toxins are not inactivated in that time. A 90 day holding period would be preferable; a 120 day holding period much better.

It is interesting to note that it is necessary to heat the milk to a higher temperature in the making of Swiss cheese than in Cheddar cheese. However, the milk still gives a phosphatase test. To date there is no record of an epidemic traced to Swiss cheese. So far it has been impossible to make a Swiss cheese from pasteurized milk.

The discussion so far has pertained to Cheddar cheese. In the case of soft cheeses where an aging period of even 60 days might be detrimental to the quality of the cheese, the requirement should be that they be made only from pasteurized milk or cream with no definite holding period stated.

#### SUMMARY

There have been reported in the United States and Canada since 1883,

59 epidemics with 2,904 cases of disease and 117 deaths. There is every reason to believe that this represents only a part of the disease caused by cheese.

The organisms most commonly associated with cheese-borne infections are members of the *Salmonella* group such as *Salmonella aertrycke*, *schottmülleri*, *typhosus*, *suipestifer*, *typhimurium* and *cholerae suis*; *Staphylococci* such as *Staphylococcus albus* and *aureus*; of the *Brucella* group *Brucella melitensis* but not *abortus*; and *Clostridium botulinum*. There are no reports in the literature of undulant fever due to *Brucella abortus* although cheese doubtless is made from milk containing an abundance of these bacteria. Likewise there are no reports in the literature of septic sore throat or scarlet fever due to streptococci despite the fact that these organisms must be present at times in raw milk made into cheese. *Escherichia coli* is not considered as a cause of cheese poisoning. In Europe several investigators have considered it responsible for the toxin symptoms of illness due to cheese.

Contrary to the opinion of many cheese makers, pasteurized milk makes a consistently higher scoring and better flavored Cheddar cheese than cheese made from raw milk. Cheese made from pasteurized milk can be ripened in about half the time required to ripen cheese made from raw milk, since it can be held at a higher temperature. Experiments made by seeding pathogens into milk and making the milk into cheese show that the pathogens die out more rapidly at the higher temperatures.

There are seven states and Canada that now require cheese to be made from pasteurized milk or cream or to be held in storage for periods ranging from 60 to 120 days in lieu of pasteurization. The 60 day holding period is considered too short a time since pathogens may survive this storage period, especially if the cheese is held at

low temperatures, 40 to 50° F. A 90 day holding period is considered preferable and 120 days still better. All milk used in making soft cheeses should be required to be pasteurized since many soft cheese cannot be held for 60 days without spoilage or deteriorating in quality.

**Acknowledgments**—In compiling the list of epidemics traced to cheese, the author wishes to thank and acknowledge the assistance given by Dr. R. S. Breed of the New York State Experiment Station, Geneva, N. Y., for submitting all his correspondence and records on cheese epidemics, and W. D. Tiedeman and C. S. Leete of the New York State Health Department, Albany, N. Y., for supplying the list of cheese epidemics which had been compiled in their office over a period of years; and finally to A. W. Fuchs, U. S. Public Health Service, Washington, D. C., for the list of epidemics caused by cheese as reported by various state and city health officers to his office.

#### REFERENCES

1. Baker. Michigan State Board of Health Report, 122-128, 1884.
2. Blix and Tesdal. *Norsk. mag. f. Laegevidensk.*, 89:689-707. Cited by Tanner, *Food-Borne Infection and Intoxications*, 1933, p. 255.
3. Bow, M. R. Personal correspondence R. S. Breed, Oct. 18, 1944.
4. Bowman. *Canad. Pub. Health J.*, 33:541, 1942.
5. Breed, R. S. Personal communication from State Dept. of Health, Springfield, Ill.
6. Bundesen, H. M. Personal correspondence, New York State Board of Health, 1936.
7. Cilli. *Bull. Stal. Ig. trop. (Sex Eritrea)* Asmara, 2:28, 1943. *Dairy Sci. Abstr.*, 6:339, 1944.
8. Cleynert. *Nederl. tijdschr. v. Geneesk.*, 2:1309 (Sept. 24), 1927.
9. Dairy Division, U. S. Dept. Agr. *J. Milk Tech.*, 9:171, 1946.
10. Evans and Aberd. *Lancet*, Nov. 14, 1908, p. 1443.
11. Erickson. *Food Indust.*, Aug. 1946, p. 8.
12. Fabian. *J. Milk Tech.*, 9:129, 1946.
13. Florentine. *Ann. d'hyg.*, 16:539, 1938.
14. Foley. 11th Ann. Rep. Prov. Bur. Health, 1932-1933, p. 25, Montreal, Canada.
15. Frary, Guy G. Letter to R. S. Breed, Aug. 4, 1939. Also letter F. W. Fabian, Nov. 14, 1946.
16. Freidel and Yale. *J. Milk Tech.*, 8:49, 1945.
17. Gauthier and Foley. *Canad. Pub. Health J.*, 34:543, 1943, also *J. Milk Tech.*, 1:211, 1944.
18. Gershaw. *Canad. M. A. J.*, 51:138, 1944. Also *Biol. Abstr.*, 18:22194, 1944.
19. Graham-Stewart and Associates. *Brit. M. J.*, 1:1934, 1928.
20. Halverson. *A.J.P.H.*, 34:840, 1944. Also *California's Health*, June 15, 1944.
21. Hardman & McKinnon. *Canad. Pub. Health J.*, 21:359, 1930.
22. Kathe. *Zentralbl. Bakt.*, I Original, 140:71, 1936.
23. Linden, Turner, and Thom. *Pub. Health Rep.*, 41:1647, 1926.
24. Levine, J. *Lab. & Clin. Med.*, 2:761, 1917.
25. McCarthy, J. A. Personal correspondence New York State Board of Health, 1936.
26. Macaulay. *Lancet*, 2:1012, 1922.
27. McCrady, H. M. Personal correspondence R. S. Breed, Sept. 15, 1944. Also *Canad. Pub. Health J.*, 36:116, 1945.
28. MacDonald. *Monthly Bull.*, Min. Health Emergency Public Lab. Serv. Med. Res. Council (Gr. Brit.), 3:121, 1944. Also *Dairy Sci. Abstr.*, 6:138, 1944.
29. Menzies. *Canad. Pub. Health J.*, 35:431, 1944.
30. Nevin. *J. Infect. Dis.*, 28:226, 1921.
31. Nevin and Mann. *Reports of New York State Dept. Health*, 3:306-307, 1915.
32. Newman, G. *San. Record*, London. Suppl. 29, 1902.
33. New York State Health News, Sept. 4, 1939.
34. Reed. *J.A.M.A.*, 21:354, 1943.
35. Reissland and Steinbach. *Veröffentl. a.d. Geb. d. Med. Verwalt.*, 27:813, 1928.
36. Rice. *Month. Bull.* Indiana State Bd. Health, 47:29, 1944.
37. Rich. *A.J.P.H.*, 13:210, 1923.
38. Sammis and Bruhn. *Wisconsin Agr. Exp. Research Bull.* 27, Dec., 1912.
39. Savage and White. Med. Research Council, *Spl. Rep. Series*, 92:90; 39, *Ibid.*: 91, 1925.
40. Schade. *Zentralbl. j. Bakt.*, Abt. I, 143:67, 1938.
41. Schytte and Tesdal. *Norsk. mag. f. Laegevidensk.*, 89:689, 1928.
42. Schlesinger. *A.J.P.H.*, 33:1257, 1943.
43. Schubert and David. *Med. Klin.*, 1935, p. 979.
44. Sherman, Smiley, and Nevin. *J. Dairy Sci.*, 24:321, 1943.
45. Sievers. *Weekly Rep.* Ending April 7, 1945. Div. of Communicable Diseases, Week No. 14, Illinois Dept. of Public Health.
46. Thomson, M. G. Personal correspondence F. W. Fabian, Nov. 2, 1946.
47. Thompson. *Canad. M. A. J.*, 29:9, 1933.
48. Thomas and Carll. *Rev. in Bull. Hyg.*, 2:825, 1947. Also see *U. S. Nav. M. Bull.*, 25:484, 1927.
49. Tucker, Cameron, Henderson and Beyer. *J.A.M.A.* 131 (14):1119, 1946.
50. U. S. Public Health Service. Obtained from list of disease outbreaks conveyed through milk and milk products in the U. S. as reported by state and territorial health officers to the U. S. Public Health Service and compiled by A. W. Fuchs. List of cheese epidemics has been compiled only since 1935.
51. Wade and Shere. *A.J.P.H.*, 18:1480, 1928.
52. Wilson, Hall and Rogers. *J. Dairy Sci.*, 28:187, 1945.
53. Wright. *Bull.*, Dept. Health, Kentucky, 18:492, 1945.

# Cardiolipin and Purified Lecithin as Reagents in Syphilis Serology\*

AD HARRIS AND J. F. MAHONEY, M.D., F.A.P.H.A.

*Serologist and Medical Director, Venereal Disease Research Laboratory, U. S. Marine Hospital, U. S. Public Health Service, Staten Island, N. Y.*

ATTEMPTING a general statement in regard to the value of a scientific achievement at a time when available information is admittedly inadequate is always dangerous. Cardiolipin as an antigenic substance in tests for syphilis has been employed only in a few laboratories and for a relatively short period. The early impressions are favorable, even enthusiastic. The hope is general that the substance will prove to be capable of effecting major changes in the structure of syphilis serology, that will serve to eliminate at least some of the uncertainties which are inherent in the methods presently employed, and that it will promote a greater degree of uniformity in test results.

The purpose of this report is to review briefly the present application of cardiolipin antigens in the serology of syphilis and to mention some of the avenues through which future advances in this phase of laboratory testing may be anticipated. Cardiolipin antigens referred to in this discussion are mixtures of cardiolipin and purified lecithin with cholesterol in varying proportions.

Cardiolipin and purified lecithin were first described as effective serologic antigen components by Pangborn<sup>1</sup> in

1941. Antigens formed of these substances have since been reported as suitable reagents in both complement-fixation and flocculation tests for syphilis. Test procedures in which cardiolipin antigen has been employed include the Kolmer test as reported by Harris and Portnoy,<sup>2</sup> the New York State quantitative complement-fixation test reported by Maltaner and Maltaner,<sup>3</sup> macro- and microflocculation tests by Brown,<sup>4,5</sup> and three microflocculation slide tests by Rein and Bossak,<sup>6</sup> Kline,<sup>7</sup> and Harris, Rosenberg, and Riedel,<sup>8</sup> respectively. Also, a preliminary report has been published recently by Kahn<sup>9</sup> on the use of cardiolipin antigen in the standard Kahn test and in a micro-flocculation procedure. The opinions and recorded findings contained in these published reports indicate that this reagent can be successfully employed, under routine testing conditions, in either flocculation or complement-fixation technics.

The experience of the writers dates from 1943 at which time the employment of cardiolipin antigens in the Kolmer complement-fixation technic was studied. The antigens were found to possess a minimum capacity to deviate complement in a nonspecific manner in the absence of human sera. This is a desirable characteristic of an antigen selected for complement-fixa-

\* Presented before the Laboratory Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 12, 1946

tion testing. The studies also confirmed the ability of the newer product to replace the conventional lipoidal material without technical modifications in the test method. Spinal fluid testing was not carried out at that time but later experience indicated the usability of the newer antigen in that field.

In subsequent studies the use of cardiolipin antigen in flocculation methods was canvassed. This work led to the development and publication of a slide flocculation method employing a cardiolipin-lecithin ratio which appeared to be optimal for a microfloculation reaction. Continued use of this method has failed to bring to light major technical deficiencies.

The part that cardiolipin and lecithin play as antigenic components is not clearly defined, nor is the exact physiochemical reaction occurring in a positive serologic test known. Neither cardiolipin nor lecithin alone, nor either of these substances in combination with cholesterol, has been found to be a suitable antigen. However, a point of optimum relationship between cardiolipin and lecithin can be determined so that maximum antigenic activity may be elicited under specified testing conditions. An antigen formula found to be most suitable for one test procedure may be unsatisfactory in another. For this reason, the use of a common antigen in all test procedures would not necessarily produce similarity of test results. The part that a stabilized antigen or antigen source can take in the future standardization of serologic procedures appears to be definite but limited.

Certain similarities exist between cardiolipin and the other lipoidal antigens. They have a common source, which is beef heart. Cardiolipin and lecithin, as such, may be the major reactive components of the usual lipoidal antigens. It is also probable that other substances contained in these lipoidal antigens, but discarded during the prep-

aration of cardiolipin and purified lecithin, may be responsible for some nonspecific reactions.

In the serodiagnosis of syphilis there appear to be two general reasons for nonspecificity. The first is the ability of some diseases and upper respiratory infections to produce a reactive substance in the blood stream serologically similar to the reagin that characterizes syphilis. The second, and possibly there is no real distinction, is the presence of substances in the blood serum other than the reagin of syphilis, which have the capacity of reacting with fractions in the antigen other than the syphilis reacting fraction.

The refinement of the cardiolipin antigen components, and the consequent elimination of many adventitious extractives, may well have the effect of eliminating some of the nonspecific reactions. This appears to be borne out by the early impressions derived from limited practical experience. Not any evidence is available up to the present, however, which indicates that cardiolipin antigens render a test procedure immune to the influence of reacting substances produced by malaria, leprosy, mononucleosis, and virus pneumonia. Emphasis is lent to this point by an article recently submitted for publication by Stout.<sup>10</sup>

*Sensitivity*—The availability of reasonably reproducible antigens such as mixtures of cardiolipin and lecithin forces to the front a general problem which will require clarification before the fullest usefulness of these substances may be obtained. This point concerns the level of reactivity at which a given test method, utilizing cardiolipin antigen, may be adjusted in order best to serve the field of clinical syphilis.

In the past, the individual originator of a test method selected an arbitrary level of reactivity which was considered to be productive of results of greatest usefulness in terms of clinical

syphilis. Antigen preparations for some of the distinctive methods were adjusted to a range of reactivity considered to be optimal. In other methods an antigen preparation which failed to display acceptable reactivity was discarded. With the newer chemical it appears to be possible to establish a relatively precise point of reactivity and to develop cardiolipin-lecithin ratios which will consistently reproduce the desired reacting capacity.

In the event of a uniform level of the above type being found to be feasible and desirable, it would become necessary to establish and to define the level of reactivity which contributes the optimum of sound information. A comprehensive laboratory and clinical study, participated in by leaders in the several professional fields, would appear to be essential to the determination of the level which would be the most informative as regards syphilis.

There are two general considerations which may become important factors in determining the level of reactivity of the test procedure of the future. The first bears upon the use of serology in the post-treatment observation of patients who have received penicillin. The general character of the serology curve, plotted for months or years following treatment, contributes information of real value in evaluating the therapy and in guiding the subsequent management of the patient. The individual test finding is of minimal value except as it contributes to the character of the curve.

Second, a change of equal magnitude is taking place in the interpretation of low reading positive and doubtful reactions in the serum of individuals without history or clinical evidence of syphilis. The previous tendency was to ascribe diagnostic importance to any positive reaction which was confirmed by repeated tests. This significance is being replaced by skepticism arising

from the knowledge that many conditions other than syphilis may be responsible for positive findings, and that many of these reactions are spontaneously reversed following the passage of weeks or a few months.

These shifts in values may well argue against the employment of test procedures which are highly sensitive because of the minimum importance of findings in the threshold zone in either the follow-up observation of treated disease or in the establishment of an abstract diagnosis of syphilis.

The maintenance of test reactivity levels on whatever plane may be finally selected as optimum, would necessitate the use of constantly reproducible reagents. For this reason, methods selected for the isolation, purification, and assay of antigen-source-substances, such as cardiolipin and lecithin, could be retained until reagents prepared by other methods were proved to be of superior quality. Investigative endeavors would, in this way, be divorced from efforts attendant to the routine production of serologic antigen.

This action would not inhibit or retard research into the further identification of antigen components, selection of other antigen sources, or the formulation of new or modified testing procedures. Contrarily, these endeavors could be expedited since definite and reproducible performance standards would be available for preliminary comparison.

Further light may be shed on the mechanisms involved in serologic reactions by investigations directed to the identification of the reactive components of serum and clarification of the interdependencies, both physical and chemical, of cardiolipin, lecithin, and cholesterol as antigen fractions. Some progress in this field has been reported by Neurath<sup>11</sup> in a study of the behavior of selected serum fractions with cardiolipin and other lipoidal antigens.



The Pangborn achievement, in making available an antigen composed of more nearly purified substances, at once stimulates speculation as to whether or not the end has been reached in this regard. If the refinement of the fraction of beef heart which is responsible for its antigenic power has reached the cardiolipin stage, there may remain the possibility of carrying the process to a still more simple chemical entity. The inference is fair that the specificity of the reaction produced by the refined product might exceed that of the present compound much in the same manner that the present compound exceeds that of the conventional antigens of lipoidal nature.

Following the same general field of speculation, the development of the structural formula of the product would be helpful as a step in the process of identifying the molecular grouping responsible for the reactivity of the preparation. This in turn would lead to a search elsewhere in nature for similar groupings some of which, conceivably, might be free from the serious handicaps which are inherent in the source of the present product. The ultimate in this general regard would be the reduction of the active principle to a compound capable of reproduction by chemical synthesis. This should have the effect of reducing the antigen factor in blood testing to a precise basis and of abolishing the remaining uncertainties which are associated with the lack of ability to reproduce accurately the antigenic substance in pure chemical form.

The potentialities of cardiolipin appear to offer hope for improvement of existing conditions in another direction. All who have been interested in either the clinical or public health aspects of syphilis have been impressed with the need for laboratory methods which are capable of avoiding the production of conflicting and discrepant

findings. It is realized that many instances of this kind are due to variations in the compositions of antigens, to differences in reactivity levels, and to differences in test mechanics. Discrepancies are, therefore, unavoidable under the present circumstances. The elimination of many instances of the above type could theoretically be accomplished if a simplification of the entire practice of syphilis serology could be effected through the use of cardiolipin antigens.

An initial series of steps in this general direction would seem to be (a) the development of test technics of complement-fixation, tube flocculation and slide flocculation types which would be capable of standardization in all details, (b) the development of cardiolipin-lecithin formulae best suited to the above mentioned test methods, and (c) the manufacture of cardiolipin and lecithin in quantities sufficient to supply all laboratories in which the standard methods were employed. The details connected with the creation of new technical methods would not be insurmountable. An unanswerable question at the moment concerns the ability of cardiolipin in the present state of its development to bear the principal burden of a program of this magnitude. Through the expedient of supplying all antigen material from a central source, together with information as to the formula to be employed in each type of test method, a high degree of uniformity of findings in different laboratories, and in different sections of the country, might be attained.

Present trends are not, however, in this direction. Previously employed test methods are being adapted to individual cardiolipin-lecithin formulae; the level of test reactivity is continuing to be an arbitrary decision on the part of the responsible author, and the number of technical methods, in place of being reduced and standardized, is being in-

creased and further complicated through the necessity of developing an antigen formula for each technical procedure.

The Venereal Disease Research Laboratory early visualized the employment of cardiolipin as a means of promoting greater efficiency in syphilis serology on a national and hemispheric basis. This program would require the authority to manufacture large quantities of the substances and to carry out assays from both chemical and serological standpoints. It would then be essential that the product be dispensed with precise formulae as to optimal combinations of cardiolipin and lecithin to be utilized in defined test procedures, or that completed antigens prepared from these substances be distributed.

Recent information is to the effect that cardiolipin is to be patented and that its future uses will be open to the scrutiny of a non-profit corporation. The effect which this contingency will have upon the application of the substance to the practical problems in syphilis serology which are facing the large laboratories of the country is not clear.

The surrounding of a scientific accomplishment with restrictive legal safeguards must be prompted by a desire to protect the public from unjustified exploitation. What would be construed as justifiable and permissible use of the product in the eyes of the patent holder must await future clarification. It is conceivable that the

program outlined may not meet with the approval of the patent holder or the commercial licensee. There is also the possibility that the patent holders may desire to reserve to themselves the function of guiding the product to its fullest usefulness in the service of humanity as a logical corollary of the desire to safeguard the public. Further progress in the employment of the product, in what may be its broadest field of usefulness, may have to await a fuller definition of policy in those regards.

#### REFERENCES

1. Pangburn, M. C. A New Serologically Active Phospholipid from Beef Heart. *Proc. Soc. Exper. Biol. & Med.*, 48:484, 1941.
2. Harris, A., and Portnoy, J. Cardiolipin Antigens in the Kolmer Complement Fixation Test for Syphilis. *Ven. Dis. Inform.*, 25:353, 1944.
3. Maltaner, E., and Maltaner, F. The Standardization of Cardiolipin-Lecithin-Cholesterol Antigen in the Complement-Fixation Test for Syphilis. *J. Bact.*, 49:199, 1945.
4. Brown, R. Cardiolipin, Lecithin, and Cholesterol in the Antigen in the Precipitation Test for Syphilis. *J. Bact.*, 47:581, 1944.
5. Brown, R. Cardiolipin in Macro- and Micro-precipitation Tests for Syphilis. *J. Bact.*, 49:199, 1945.
6. Rein, C. R., and Bossak, H. N. Cardiolipin Antigens in the Serodiagnosis of Syphilis. *Am. J. Syph., Gonorr. & Ven. Dis.*, 30:1, 1946.
7. Kline, B. S. Cardiolipin Antigen in the Microscopic Slide Precipitation Test for Syphilis. *Am. J. Clin. Path.*, 16:2, 1946.
8. Harris, A., Rosenberg, A. A., and Riedel, L. M. A Microflocculation Test for Syphilis Using Cardiolipin Antigen. *Ven. Dis. Inform.*, 27:7, 1946.
9. Kahn, R. L. Kahn Reactions with Cardiolipin Antigen Compared with Kahn Antigen. *Univ. Hosp. Bull., Ann Arbor*, 12:9, 1946.
10. Stout, G. W. Reactivity of Tests Using Cardiolipin Antigens in a Limited Number of Nonsyphilitic Cases. *Am. J. Syph., Gonorr. & Ven. Dis.*, 31:3, 1947.
11. Neurath, H. Personal Communications.

# Importance of a Standard Code for Tabulating Causes of Illness\*

SELWYN D. COLLINS, PH.D., F.A.P.H.A.

*Division of Public Health Methods, U. S. Public Health Service, Bethesda, Md.*

THE *International List of Causes of Death* was adopted more than 50 years ago and has been revised five times, at approximately ten year intervals. Although it has been severely criticised on many occasions, and with respect to particular parts of the classification, its use has continued in many countries over the half-century. In spite of its shortcomings it has had a great part in keeping alive an interest in mortality statistics in many parts of the world which would have abandoned the work without the stimulation of international coöperation and comparison.

Today there is much interest in sickness statistics. Since the beginnings of morbidity statistics for the general population of this country as represented by Sydenstricker's Hagerstown incidence studies,<sup>1</sup> and the prevalence surveys of the Metropolitan Life Insurance Company,<sup>2</sup> it has been realized that deaths, which represent not more than 1 per cent of all illnesses, are a poor index of morbidity. Today many persons are seeking new ways of securing adequate indexes of the health of communities, states, and nations. What more natural than to turn to morbidity statistics.

There are many organizations that

need a code for tabulating causes of illness. A few years before World War II there was a great movement to code and index causes of hospitalized illness and many requests came to the Public Health Service for a code, an alphabetical index, and other helps to classify properly the diagnosis of the illness, or in more technical terms, the cause of admission to the hospital. Uniform or not uniform, there is a great demand for a diagnosis code for statistical purposes. If such a list is coupled with the *International List of Causes of Death* and can thereby obtain wide acceptance and use, it will meet an extremely urgent need and will encourage the assembling of morbidity statistics. Through the efforts of the Pan American Sanitary Bureau, the Public Health Service-Census Code<sup>3</sup> has already been translated into Spanish and the index translated and rearranged for the use of Spanish speaking countries in Central and South America. The volume has not yet been published.

The large increase in hospitalization which has occurred in the past 20 years has been another important reason for developing a morbidity code. Hospitals invariably keep records of the causes of admission and with a suitable code and an alphabetical index many of them would set up annual tabulations of the diseases of persons admitted to the hospital, with a separation of surgical, medical, and obstetrical cases. The

\* Presented before a Joint Session of the Epidemiology and Vital Statistics Sections of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 13, 1946. Published by permission of the Surgeon General.

American Hospital Association now has a Committee on Morbidity Statistics whose chief function is to select or prepare a diagnosis code suitable for tabulating hospital statistics on causes of admission.

It is particularly important to tabulate diagnoses for hospital admissions if they are to be understood and interpreted as an index of the health of the community. Without diagnosis it appears that, in contrast to other health indicators, the period of greatest morbidity is the summer. However, an analysis of the situation indicates that so much surgery is elective as to the particular time of the operation that a great deal of it is put off until the more favorable indications of the summer period, and to the times when school children, school teachers, and others with summer vacations can take care of those chronic conditions that are not emergency cases.

In any special study of morbidity, the investigator is always tempted to prepare a diagnosis code that is tailored to the terminology and needs of his specific study. The method is to make a sample tabulation in terms of the diagnosis names actually used in the particular study. Such a code undoubtedly reflects in the truest light the data reported in this one study. However, it means that tabulation on each study is delayed until a code can be prepared, and furthermore that comparison with other studies can be made in only a limited way. A standard code that fits the data reasonably well avoids making a new code for each study and facilitates more extensive comparison. To prepare even a simple code and make an index of medical and diagnostic terms is such a time-consuming job that analysis proceeds slowly if it has to be redone for every study.

A certain degree of uniformity is an advantage in projects of any kind on which two or more groups are working

with similar objectives. However, if all aspects of the two or more projects are stereotyped, they become so mechanized that intelligence and judgment are no longer useful because everything is cut to fit the machine regardless of whether the final product gives a true picture of the original data.

Uniformity is an advantage only if the code which is adopted is adequate. The mere adoption of an *International List* for morbidity tabulations would benefit no one if that code were not a workable and useful list with enough detail to set forth the real facts of morbidity but not enough to make the code unwieldy and impossible to use. To secure the adoption of an unsuitable code would only set back by at least 10 years international agreement upon a workable morbidity code.

Given a reasonably good code, uniformity encourages comparison and comparison usually leads to a better understanding of any problem. Comparisons that would be useful are:

1. Sickness rates among trainees and others in the armed forces as compared with civilians of similar age and sex
2. Sickness among industrial employees as compared with the general population of similar age and sex
3. Comparison of sickness and mortality with respect to variation with age, sex, size of city, and geographic section

Uniformity is also useful in comparison with the past, but with changing conditions and ever increasing knowledge of the nature and causes of disease, uniformity with the past must be sacrificed in many instances where the continuation of old classifications would be meaningless in the light of present knowledge. Therefore, any system of disease classification should provide for orderly methods of amendment and extension of the code to meet new conditions.

In past revisions of the *International List* and in any contemplated future ones, the cause of death codes cover the

whole list of diseases. The problem is always to make the code short enough to be a usable statistical instrument and yet contain the detail that will make the categories sufficiently specific to be meaningful. Special studies of a particular disease or disease group would need more detail than could be put into an overall statistical list covering all diseases and injuries. It would not be expected, for example, that a general morbidity or mortality code would be detailed enough for special studies of such diseases as cancer, heart diseases, tuberculosis, and syphilis, or of such matters as maternal and infant health. Research projects and special studies cannot afford to use a uniform code unless it meets their particular needs. All one can hope for is that the classifications used in special studies might be collapsible into the rubrics of a uniform code to assist the investigator in comparing his data with such other morbidity and mortality data as are available.

In this connection a distinction should be made between a list for statistical tabulations and a nomenclature. The purposes of a nomenclature are to assist the attending physician to make the proper diagnosis and to give that morbid condition its standard name as accepted in the best medical circles. In such a nomenclature the thousands of morbid states must each be listed separately but not necessarily with a number attached. A statistical list would show important specific categories arranged in groups of similar diseases with the more indefinite and less important conditions grouped into a limited number of miscellaneous categories.

It would be a mistake to overemphasize the importance of a uniform code. A uniform code in itself does not make comparable statistics—it is only the first step toward obtaining some uniformity in the statistics.

Referring first to the international situation, the *International List of Causes of Death* has been uniform for many years in terms of the categories and subcategories of the list, but an examination of the coding manuals of England and the United States indicates a considerable number of differences in the assignment of diagnostic terms to the several rubrics. Some of these discrepancies represent differences in medical terminology in the two countries, but others can be corrected by close coöperation in the assignment of inclusions under the various categories.

The United States began the allocation of deaths to the residence of the patient only in 1939, whereas in England this has been done for many years. Aside from war years, this step would presumably make little difference in data for the country as a whole, but as soon as tabulations are made separately for urban and rural parts of the country, or by size of city, the allocation for residence makes a very important difference in the rates. With the exception of tuberculosis, for which the hospitals are usually located in the country, the cities, and particularly the smaller cities, draw a disproportionately large number of deaths from the surrounding rural areas because most hospitals are located in towns and cities. In the larger cities the nonresident deaths may not change the rate a great deal, but in the counties surrounding the cities they make a very large percentage change because of the smaller populations in the outlying areas.

The Health Section of the League of Nations (now a part of the World Health Organization) realized early the lack of comparability of statistics on the causes of death in the different countries. Edgar Sydenstricker, who organized the epidemiological work of the League, inaugurated a series of inter-country studies to determine the extent to which death rates from specific causes were

comparable in different countries using the *International List of Causes of Death*.

The discussion thus far has centered mostly upon the question of comparability as between two or more jurisdictions such as counties, cities, and nations. There is, however, an entirely different kind of uniformity, namely, a single code for tabulating causes of illness and of death. It is sometimes maintained that since every death is an illness, a code for causes of death is entirely suitable for tabulating causes of illness. However, the importance of different rubrics in terms of frequency of cases is so entirely different for total illnesses and for fatal illnesses that a diagnosis code to cover both items must provide more categories than are needed for either illness or death considered separately. For example, as causes of illness roughly one-third of all cases are due to minor respiratory diseases, and also roughly one-third of all cases with one or more home calls by a physician are minor respiratory diseases. When the illnesses under consideration are limited to those which confined the patient to bed for one or more days, an even larger proportion is due to minor respiratory diseases. On the other hand, few deaths are charged to the minor respiratory diseases, most of the respiratory deaths being due to pneumonia. Thus when tabulating causes of illness this large group of cases needs to be broken into acute respiratory attacks of various types and sites, but in tabulating deaths from respiratory diseases there is need for only a few categories and practically all of the minor respiratory disorders can be put into one miscellaneous group. However, the fact that cases and deaths are so entirely different in their distribution makes it essential that the same code be used for both fatal and non-fatal illnesses if the true picture is to be clearly portrayed.

In the matter of uniformity of illness and death diagnosis codes, there are also problems which indicate that a single statistical list is only a first step toward obtaining uniformity in coding causes of illness and death. Deaths are usually charged to the first important cause in the train of circumstances which resulted in the death of the patient. Thus a death from an old residual effect of poliomyelitis may reasonably be charged to that disease. On the other hand, in tabulating illness it would not be desirable to confuse the incidence of new cases of poliomyelitis with the accumulated residuals of prior cases; such cases would be better tabulated for illness purposes as impairments of specific types that were caused by poliomyelitis. This is particularly true for persons who had poliomyelitis many years ago but are still afflicted with residual impairments.

There are other definite differences that arise from the type of tabulation that is desired. In tabulating the incidence of the communicable diseases and of most other specific diseases one would usually count every case with its onset in a given period, regardless of whether it occurred alone or in conjunction with some other diagnosis. Thus in the acute communicable diseases, if a child had both whooping cough and measles during the same or an overlapping period of illness, one would want to count and tabulate both causes rather than only one as the primary cause of the illness. Thus to make mortality statistics comparable with those of morbidity, it seems necessary to revise some long-standing methods of tabulation and put more emphasis upon contributory causes of death. Inasmuch as this change has been needed and desired for many years, a uniform code may improve mortality statistics as well as its newer counterpart, the statistics of morbidity.

While it is clear that a uniform diagnosis list will not solve all difficulties,

such a list would make for greater stability in the handling of statistics of the causes of illness and death and would be a very important step in an attempt to obtain comparable statistics.

## REFERENCES

1. Sydenstricker, Edgar. *Hagerstown Morbidity*

*Studies, 1921-24.* A series of 11 papers in the *Public Health Reports, 1926-29.* See Vol. 44, page 2101 (Aug. 30; 1929) for list of papers with complete references.

2. Stecker, M. L., Frankel, L. K., and Dublin, L. I. *Some Recent Morbidity Data, 1915-17.* Metropolitan Life Insurance Company, 1919.

3. U. S. Public Health Service. *Manual for Coding Causes of Illness.* *Miscellaneous Publication No. 32,* U. S. Public Health Service, Gov. Ptg. Office, 1944.

---

## Dr. Breed Is Honored for Studies in Dairy and Cheese Field

Robert S. Breed, Ph.D., Professor of Bacteriology at the New York State Agricultural Experiment Station (Cornell University), Geneva, New York, was guest of honor at a recent banquet of the National Cheese Institute in Chicago.

Dr. A. C. Dahlberg, Professor of Dairy Industry at Cornell University, in speaking of Dr. Breed's contribution to bacteriology and dairy science, pointed out that his service in Geneva went back to 1913 when he began with studies on the relationship of the composition of milk to the yield of cheese and studied the value of paraffining and cold curing of cheese. He had a special interest in the bacteriology of cheese curing and particularly on the microbiology of surface-ripened cheese, such as limburger.

Dr. Dahlberg included among the best known contributions of Dr. Breed

the direct microscopic method of estimating bacteria in milk, also referred to as the "Breed Method" which is used throughout the world. Dr. Breed has also played a leading role in the development of *Standard Methods for the Examination of Dairy Products* as published by the American Public Health Association. Since 1934 and until recent months he has been Chairman of the committee which prepared these methods. Dr. Breed is also editor of *Bergey's Manual of Determinative Bacteriology*, which is a volume like *Standard Methods for the Examination of Dairy Products*, requiring the co-operation of many scientists specializing in various subjects.

Dr. Breed was presented with a traveling bag because of his travel plan following his approaching retirement, including the Microbiological Congress in Copenhagen this July.

# Morbidity Statistics Through Periodic Sample Surveys of Households\*

THEODORE D. WOOLSEY

*Statistician, National Office of Vital Statistics, U. S. Public Health Service,  
Washington, D. C.*

IT is hardly necessary to dwell for long here upon the need for national statistics on sickness and injury, nor upon the obvious inadequacies of mortality statistics as indices of non-fatal as well as fatal illness. It would be difficult to find a worker in the field of public health, or in any related field, for that matter, who is satisfied that present sources of data, applicable to the country as a whole, are sufficient for his requirements. Moreover, there are *no* statistics of morbidity which can be used to estimate the current rates of illness for the entire United States with a measurable degree of reliability. Previous surveys have been used to make national estimates, but these estimates have, perforce, been accepted on faith. They may be good estimates, but we have no way of knowing.

Surveys of households for morbidity statistics have been carried out in various groups of the population in this country from time to time for the last thirty years. Some were of the type in which a sample of households is visited for interviewing periodically for several years. The largest, the National Health Survey of 1935-1936, was a one-time survey which reached more than 2½ million individuals in 83 cities. The

statistical results from these surveys have been widely used, and generalizations have been made from them about broader segments of the population and, in fact, about the entire population. Yet no one of the major surveys was designed according to the criteria of good sampling that are now accepted. Most of the results have also become quite out-of-date, and the question arises as to whether there should not be some new source that could provide current data from which rates of illness in the entire United States could be estimated.

The matter of whether or not an effort should be made to collect at regular intervals statistical information on sickness, the cost and availability of medical care, and related subjects, revolves around such problems as: What sorts of statistics are needed? What possible sources are there that might be exploited and what are the limitations of those sources? Can statistics be collected from any one of those sources with sufficient reliability at a cost that is not prohibitive?

It is proposed to suggest here certain—possibly arbitrary—answers to these questions in order to bring the whole matter into sharper focus and perhaps to stimulate further discussion of the subject.

The answer to the first question is not so arbitrary, and yet it is based upon what one might call well informed hearsay, rather than a comprehensive

\* Presented before a Joint Session of the Epidemiology and Vital Statistics Sections of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 12, 1935.



survey of the needs of potential consumers of the statistics. This answer is as follows:

The sorts of statistics that are needed are such as will serve to integrate and calibrate the information from the many existing sources without attempting to go intensively into the special questions of health and medical care that are covered by the existing sources. At present we have numerous scattered fragments of knowledge, ranging from detailed knowledge on certain small parts of the population (such as the Eastern Health District of Baltimore, for example), to moderately detailed knowledge on fairly broad segments of the population (such as the group of workers covered by certain industrial sick benefit associations and group insurance plans) and, finally, to a scanty knowledge on the entire population, which is limited to the incompletely reported incidence of certain communicable diseases. In order to integrate these fragments there are needed certain basic statistics, not necessarily in detail as to cause of illness or geographical distribution, but of such a type that they permit statements to be made about the United States as a whole and about certain broad sub-regions of the United States (let us say, ten).

Suppose that a map maker wishes to map a vast, wild region. He has a large number of maps of small parts of the whole region. These maps were made by various previous map makers at different times in the past. They are of varying accuracy and detail. Some overlap, and where they overlap they often disagree. The map maker sets out to survey the entire region anew. He wants to make the greatest possible use of all previously obtained knowledge of the region, much of which is worth while and at least internally consistent information. He first determines the location of certain prominent landmarks with the greatest possible accu-

racy. When he feels sure of these landmarks he sinks a bench-mark in the ground at each spot. These bench-marks do not in themselves give a detailed chart of the area. They are simply reference points. The map maker then studies the older detailed surveys. Those that appear to be consistent with the bench-marks he has established are incorporated in a master map. Others are thrown out and resurveyed. New surveys are planned to fill in the empty parts of the map, starting from the bench-marks as reference points.

That analogy gives an oversimplified representation of our problem. In morbidity statistics the bench-marks would be such points of reference as the monthly rates of incidence of certain well recognized groups of diseases by age, race, and sex in each of the geographic sub-regions; the prevalence of the important chronic diseases for the same categories; the amount of time lost from work as a result of illness by persons in the labor force; the number of visits of or visits to a physician, and so forth. In contrast to the surveyor's bench-marks, these points of reference are constantly changing and, furthermore, their measurement is almost always subject to some bias. Nevertheless, it is statistics of the bench-mark type that are required in order to construct a current quantitative picture of sickness and injury in the United States. Such statistics would not replace or remove the need for the intensive studies in particular areas and the detailed periodic reports on special groups of the population. It would, however, serve to calibrate the information from existing sources. Hence, the term "calibration statistics" might be a reasonably good term to use in describing the type of data we should attempt to get.

What are the possible sources of information of this sort? The possibilities are by no means numerous, if one at-

tempts to list only the basically different ones. One could, for example, attempt to insert two or three questions in the schedule of the decennial census. But that idea has few benefits and many disadvantages. Chief among the latter are the obstacles encountered in adding questions to that already crowded form, the difficulty in giving census enumerators the proper training for the tricky definitions that are involved in morbidity surveys, and, most important of all, the ten year interval between censuses which, even for "calibration statistics," permits far too little detail to be obtained on the seasonal and secular changes in the level of morbidity and far too little opportunity to correct the biases discovered in the results.

Serious consideration was given some years ago to the possibility of collecting morbidity statistics through a registration system dependent upon the coöperation of physicians. Fortunately, the idea seems now to have been abandoned. For not only would the placing of such a burden of paper work on the physicians solely for statistical purposes have encountered vigorous and justified opposition, but the results with the best of coöperation, would have given a seriously incomplete picture. It is an accepted fact that a large part of the illness causing loss of time from work and confinement to bed is not treated by physicians.

Similar objection can be made on the basis of incompleteness, and probably also on the basis of the paper work load it would entail, to a system which called for central reporting of all hospital cases.

Despite the incompleteness of statistics collected from physicians and hospitals, this source of information might offer valuable supporting data to other surveys, and the possibility of collecting facts on the illness of their patients from samples of physicians or hospitals is one that should be studied. But in

order to include as much as possible of that illness not treated by physicians, some other source must be utilized, and that source is obviously the individual who is taken ill, or at least some member of his immediate household.

The most important of the large-scale morbidity surveys undertaken here in the United States have been of this kind. The limitations of these previous household surveys are of two general types. The first and most serious is the limitation which actually applies to any type of morbidity survey. It probably accounts for the fact that there has not been set up, to date, any index of illness in the general population. This limitation results from the elusive character of the concept of illness. It is extremely hard to set up an objective, useful definition of illness in its broadest sense. Even disabling illness, which can be defined in terms of inability to go to work, or go to school, or perform usual household duties, is not easily pinned down in the case of housewives, preschool children, infants, elderly persons no longer working, and persons with jobs who happen to be on vacation. Furthermore, social "tabus" still exist around the discussion of venereal diseases, mental diseases, cancer, and physical deformities. To add to this, there is the basic difficulty that a person may call himself ill when he is in a particular state of health, while another person in the same state of health might consider himself to be "in the pink." Can one even speak about a particular state of health disassociated from the personality in whom it exists? Many people refuse to think of themselves as ill even when the signs and symptoms of disease are obvious; others consider themselves as invalids merely to escape unwanted responsibilities or to gain sympathy and attention. Finally, it has been demonstrated that a person's memory of minor, yet incapacitating, illnesses is often limited to a month or

less, and it has also been demonstrated that interviewers vary considerably in their ability to bring out the fact of illness in the households visited.

Yet, despite these seemingly overwhelming difficulties, household surveys for morbidity have been considered a useful source of quantitative information. The National Health Survey of 1935-1936 might seem to have been pumped dry by the dozens of valuable scientific papers based upon its results, but the end is not yet in sight. This is partly a function of the tremendous demand for this type of statistics, but it also reflects the fact that the persons working with the material feel that they know enough about the lack of objectiveness in the definitions and the biases present so that they can make allowances for them when necessary. How much more they would have known, if only the survey could have been designed to be repeated at intervals!

Before citing an example of the manner in which a household survey of this type is currently demonstrating its value in Great Britain, it is necessary to discuss the second general type of limitation in the large-scale sample studies previously undertaken in this country. This limitation arises from the fact, already mentioned above, that the projects were designed without sufficient consideration for the basic requirements of a good sample design as now recognized.

For a moment, let us review these requirements. First, the design must be such that it gives the maximum reliability per dollar expended. That means that, if you have a certain amount of money that can be spent, your design must minimize the errors of estimate subject to that condition, or, if you start with the condition that the errors of estimate must lie within certain limits 99 out of 100 times, then your design must be such as to minimize

the cost of the sampling operation. Second—and the second requirement follows directly from the first—you must use a method of sampling which permits the measurement of the precision of the estimates. This rules out all purposive methods where personal judgment enters directly into the selection of the units sampled. And, third, the design of the sample must be one that can actually be carried out in practice. Sampling theory and sampling practice must be compatible.

Many people suppose that by simply increasing the size of the sample, so that a considerable part of the population to be studied is included, a good sample is thereby assured. Unfortunately that is not true, and, worse than that, it is definitely uneconomical. In the National Health Survey statistics were obtained on 2,502,391 individuals, or 3.6 per cent of the urban population of the United States in the previous census. This is really a very sizable proportion. But for various, perhaps unavoidable, reasons the cities were chosen purposively, and consequently it is difficult to know how good an estimate of morbidity in the urban population of the United States is provided by the results. Or, stated in another way, the overall rates from the sample give an estimate for the cities surveyed, but we have no way of knowing how valuable the generalizations from the 3.6 per cent are for the other 96.4 per cent.

This general type of limitation of previous large-scale household surveys is avoidable. Surveys planned for the future need not have that drawback. As far as sampling is concerned there is no reason why we should not have "calibration statistics" in morbidity, statistics from which generalizations can be made for the United States, for broad sub-regions of the country, and even for states and large cities if we want to pay enough; and, attached to these generalizations, we can have statements con-

cerning the sampling precision of the estimates.

In Great Britain, periodic surveys of illness among persons over 16 years of age are being made by a government social survey organization on behalf of the ministry of health. They were initiated in October, 1943, and with a few interruptions have provided statistics for every month since that time. Although the Health Index, as it is called, was originally set up to meet the emergency needs of a country in the depths of total war, it was found to be so useful that it was not abandoned at the end of the war. So far as can be ascertained, it is a permanent fixture.

That the British program has proved to be well worth the money spent for it, there is little doubt. New relationships between morbidity and social factors are being discovered for the English population. Some of these are relationships about which we already know quite a good deal for certain communities in the United States, but the Health Index provides statistics from which statements about the population as a whole can be made and which can be used as a basis for action in the medical program of the country. Moreover, the results of each month's investigation are available reasonably promptly, a fact which suggests an advantage that the small-scale repetitive survey has over the larger one-time study. The latter involves such massive tabulations that results are often delayed to the point of seriously diminished usefulness. Perhaps most important of all from the statistician's point of view, the Health Index provides in its original design for its own improvement in that it is repeated. It would be hard to over-emphasize the value of that repetition. It means that one can gain a knowledge of where the biases are, where the definitions are weak, and even of how they can be made more objective. In view of the fact that it is limitations of this sort

which are crucial in determining whether a household survey plan is, or is not worth while, we are led to the somewhat paradoxical conclusion that the best way to decide in this country whether sample surveys of households can yield reliable "calibration statistics" on morbidity is to set up the project the best we know how, let it run for several years, and then have no hesitation about abandoning it, if it gives inconsistent or unreasonable results.

Of course, a series of methodological pilot studies is a prerequisite to any such project. Such studies might indicate at the outset that the idea was not feasible. But if they did not, there would still have to be a probationary period of several years during which the estimates would be checked in every way possible, and every effort would be made to discover the idiosyncrasies of the index and to improve it.

This leads us to the consideration of the third question proposed at the beginning of this paper: Can statistics be collected with sufficient reliability and at a cost that is not prohibitive?

Although it is not the function of the statistician to decide whether a cost is prohibitive or not, the belief of the author of this paper that the cost need not be a major deterring factor is based upon two trends which the statistician does have an opportunity to observe. One is the trend of increasing need for current morbidity statistics to serve the purposes of action programs of an actuarial type. Medical care plans are being set up in several different parts of the country, and there is much debate on the matter of whether the federal government should operate a plan on a national scale. Planning of such programs creates a new demand for basic morbidity statistics, and, as the demand increases, the value of the product in terms of what people are willing to pay for it goes up, as we have had ample opportunity to see in recent months.

The second trend is in the direction of a better product for a given price.

During the war there was rapid improvement in the techniques of sample survey design. In fact, so rapid has the progress been that many of the new theoretical and operating principles have not yet been described in print. These contributions have been of the utmost practicality: How to divide up a sample between different strata in order to get the lowest variance per dollar expended. Whether a method involving a small bias and a small variance may perhaps be better than one with no bias but a larger variance, other things being equal. How to construct a sample in such a way that it will make for administrative efficiency in the field. How to select and train interviewers. How to design interviews for information on subjective matters. How to combine a mail questionnaire survey with a personal interview survey in order to preserve the best features of both. And so forth.

The recent advances in sample survey design have a very direct bearing on the problem of collecting morbidity statistics by means of household interviews, for as a result of them substantial gains can be made in the precision of the estimates per dollar expended.

But it must constantly be borne in mind that the total error of the estimate results from bias as well as from errors of sampling. If we were content to ask such simple, objective questions as "Have you visited a doctor or had a doctor visit you in the past month?" bias would be unimportant, and there would be no question that the cost of obtaining current national and even regional estimates would not hinder us from setting out immediately to collect the statistics. But the demand for "calibration statistics" to serve the needs of public health activities and pro-

grams directed at medical care will not be satisfied so easily. These consumers require at least to know the total amount of illness of various degrees of severity in each important segment of the population. The fact of illness, as we have already said, depends upon who asks the question, how the question is phrased, at what stage of ill health the interviewed person considers himself ill, how good his memory is, and so forth. Hence, beyond a certain limit, no amount of additional money put into increasing the size and representativeness of the sample will yield any increase in the reliability of the results.

#### CONCLUSION

In conclusion, then, the answer to the third question which was posed at the beginning of this paper must remain indeterminate until such time as methodological pilot studies and a full-scale trial for a period of at least a year can be undertaken. The objective should be "calibration statistics" of the type described. The method should be sample surveys of households. The pilot studies should seek the answers to such questions as: What definitions are to be used? What type of interview will best bring out the information? What type of interviewer should be employed? Over how long a period of time is the informant's memory to be relied on? The trial period should be a full-dress rehearsal with a limited audience—that is, with restricted publication of the statistical results—continuing until all the peculiar characteristics of the material are understood and all the known faults eliminated. At the end of the trial period, an independent committee of experts might be called upon to determine whether the periodic surveys should be continued.

# Experience with Vaccination Against Influenza in the Spring of 1947

A Preliminary Report \*

THOMAS FRANCIS, JR., M.D., F.A.P.H.A., JONAS E. SALK, M.D., AND J. J. QUILLIGAN, JR., M.D.

*Department of Epidemiology and the Virus Laboratory, School of Public Health, University of Michigan, Ann Arbor, Mich.*

ON the basis of accumulated experience an outbreak of influenza A was anticipated in the winter of 1946-1947. In an effort to gain further information concerning the efficacy of influenza virus vaccine in the prevention of the disease a study was undertaken at the University of Michigan. The vaccine, with expiration date of February, 1947, was received from Army stores through the Service of Preventive Medicine, Office of the Surgeon General. The material had been prepared in the same manner as that utilized in previous studies<sup>1-5</sup> which had demonstrated a prophylactic effect. Its red cell agglutinating titer was 5,120 by a pattern test,<sup>6</sup> the same as that of the standard National Institute of Health control vaccine titrated simultaneously. Immunization of mice demonstrated that its antigenic potency was ten times greater than that required by the National Institute of Health.

## VACCINATION PROGRAM

Through the staff of the Student Health Service, under the acting Directorship of Dr. Margaret Bell, vaccination was offered to the student body on

a voluntary basis. The bulk of the vaccination program was carried out between October 22 and November 2, 1946, and an individual record was prepared for each student. Ten thousand, three hundred and twenty-eight students received vaccine and 7,615 did not. A small number of individuals with marked sensitivity to eggs were excluded. No anaphylactic or other allergic reactions were observed and, according to the records of the Health Service, the number of individuals with systemic complaints was less than 1 per cent.

In case of illness practically all students reported to the Student Health Service where they were seen by physicians who had participated in the studies of previous years and were, therefore, well acquainted with the general diagnostic procedures. A record was kept of all individuals reporting with respiratory infections. Cases suspected to be influenza were studied in relation to etiology.

Early in March, 1947, an increased amount of respiratory disease was observed. At the same time there was an increased incidence of illness with nausea, vomiting, and diarrhea in certain groups. However, the other illnesses appeared to be more characteristic of mild influenza. Only patients with significant fever were admitted to the

\* This investigation was conducted under the auspices of the Commission on Influenza, Army Epidemiological Board, Office of the Surgeon General, United States Army, Washington, D. C.  
Also aided by United States Public Health Research Grant

TABLE 1

*University of Michigan 1946-1947 Vaccination Study  
Geometric Mean Antibody Titers before and Two Weeks after Vaccination*

	Subjects	Virus Strains					
		PR8-A		Weiss-A		Lec-B	
		Pre	Post	Pre	Post	Pre	Post
Not Vacc. Prev.	68	38	400	35	271	86	512
Vacc. 1 yr. Prev.*	28	238	420	178	330	297	458
Total Group	96	63	410	59	289	120	497

\* Army veterans vaccinated between October, 1945, and January, 1946

infirmary where further details of history, throat washings, and blood specimens were obtained. As the outbreak increased in scope some of the febrile illnesses were handled as outpatients and others were visited in their residences. From March 3 to April 4 when spring vacation began, 1,359 cases of illness were recorded, an incidence of 7.6 per cent for the period of the outbreak.

During the same period 183 patients were admitted to the infirmary, and from 94 of these materials for virus studies were obtained.

#### ANTIBODY RESPONSE TO VACCINATION

Sera were obtained from 96 individuals before vaccination and 10 days or more after vaccination (Table 1). Sixty-eight of them had not been previously vaccinated and showed excellent responses. Twenty-eight of the group were individuals with clear records of vaccination in the Army approximately one year prior to the present inoculation. It is of interest to observe that their titers before vaccination were still quite high after the interval of one year and that their final level of antibody titer after vaccination did not go beyond that of individuals being vaccinated for the first time. The data indicated, then, that the vaccine had effectively stimulated production of antibody to the strains of virus in the vaccine.

#### VIRUS STUDIES

Great difficulty was encountered in isolating virus from the throat washings

of the patients. Intensive efforts were made to isolate virus in embryonated eggs from the throat washings of 28 patients. Thirteen specimens were investigated by repeated allantoic passages with only negative results. Eight specimens were examined by amniotic inoculation of 10-11 day embryos; all were negative. Ten specimens were inoculated into the amniotic sac of 13-15 day embryos. Six apparently positive results were obtained under these latter conditions. They have not been adapted to allantoic passage, however, and red cell agglutination was demonstrated only with human and guinea pig erythrocytes but not with those of chickens.

Three specimens of throat washings induced characteristic responses in ferrets and were passed in series in that animal. Thence, these strains were adapted to mice and from mice to eggs by the allantoic route. Three additional specimens stimulated antibodies in ferrets. Two were entirely negative. Adaptation of virus to mice after ferret passage was slow and three to five serial passages in the latter species were required before pulmonary lesions were clearly observed. The difficulty in establishing virus in eggs is quite different from our previous experience with influenza A.

Serological evidence indicates that the virus is a strain of influenza virus, Type A. The majority of patients recovering from the illness showed increased antibody titers to the PR8 strain and to a newly isolated strain

TABLE 2

Comparison of Mean Antibody Titers in Acute and Convalescent Phase Sera of Hospitalized Patients

Group	Number	Serum	Virus Strains			
			PR8		Rhodes	
			Titer	Difference	Titer	Difference
Unvacc.	39	Acute	76		27	
		Conv.	230	3.0X	120	4.4X
Vacc.	55	Acute	499		32	
		Conv.	809	1.6X	115	3.6X

TABLE 3

Comparison of Individual Responses to PR8 and 1947 Strain of Influenza Virus, Type A

	PR8		Rhodes—1947	
	Acute	Conv.	Acute	Conv.
1947 Illness				
Ben	64	128	32	256
Stone	64	512	<32	64
Tier	256	2,048+	32	1,024
1946 Vaccinated	Pre	Post	Pre	Post
Senec	<32	8,192	<32	64
Yager	32	2,048	<32	<32
Diaz	<32	8,192	<32	<32
Dens	32	8,192	<32	2,048+
1943 Illness	Acute	Conv.	Acute	Conv.
Cope	<32	4,096	<32	<32
Chap	32	1,024	<32	<32
Poul	64	1,024+	<32	128

(Rhodes). The mean acute and convalescent titers in unvaccinated individuals were 76 and 230, respectively, for PR8; 27 and 120, respectively, for Rhodes (Table 2). It is of interest to point out that the mean titers in the acute stage of illness were 76 in the unvaccinated and 499 in the vaccinated when tested against PR8. This latter figure is essentially the same as that of the group tested 2 weeks after vaccination, indicating that there had been no sharp loss of antibody level in the interval since vaccination. In sharp contrast, however, there was no significant difference in the low titers of vaccinated and unvaccinated individuals in the acute stage of illness when tested with the new strain. It was of further interest that when comparing the titers of sera from individuals before and after vaccination in 1946, the majority showed a good rise to PR8 and Weiss strains which were included in the vac-

cine but little increase in antibody to the new strain (Table 3). Further tests with acute and convalescent sera from patients suffering from influenza A in 1943 showed a sharp increase in titer to the PR8 strain with little or slight antibody production to the current new strain. These results clearly indicate that the strain prevalent in this outbreak has a sharp antigenic difference from those commonly encountered in previous years and from those incorporated in the vaccine.

#### INCIDENCE OF ILLNESS IN VACCINATED AND UNVACCINATED INDIVIDUALS

The amount of respiratory disease that occurred in vaccinated and unvaccinated persons during the period of the outbreak is shown in Table 4. That the major proportion of cases was due to the influenza virus was indicated by positive serological evidence of infection in approximately 80 per cent of the



TABLE 4

*Comparison of Incidence of Respiratory Disease in Vaccinated and Unvaccinated Individuals*

	Vaccinated (10,328)		Unvaccinated (7,615)	
	No. of Cases *	Incidence Per cent †	No. of Cases *	Incidence Per cent †
Inpatients	88	0.85	85	1.12
Outpatients	616	5.96	489	6.42
Room Calls	39	0.38	42	0.55
Total	743	7.19	616	8.09

\* Number of cases in interval March 3–April 4, 1947.

† Based on the assumption that the populations under study remained unchanged in the interval between vaccination and the outbreak. Actually a slight but comparable reduction occurred in both vaccinated and unvaccinated groups.

94 hospitalized patients. It is clearly evident from the data that the incidence of disease was no different in vaccinated and unvaccinated individuals.

#### INTERPRETATION

In view of the laboratory studies indicating that the antibody titer for the new strain was essentially the same in vaccinated and unvaccinated persons, it is not surprising that the amount of illness was practically the same. Since the antibody titers to the strains of virus in the vaccine were high in the vaccinated individuals who became ill, it seems unlikely that the ineffectiveness of the vaccine in the prevention of influenza in this instance was related to the interval of time between vaccination and the appearance of the outbreak.

All the data point to the probability that the antigenic deviation of the virus encountered is the responsible factor. This is further supported by the evidence obtained with ferret sera. The sera of ferrets inoculated with the new strains ordinarily developed high titers to recent (1947) strains isolated here and also to some furnished by Dr. J. E. Smadel of the Army Medical School, but had decidedly less response to the PR8 and Weiss strains of Type A. Convalescent sera from ferrets inoculated with these two latter strains also exhibited high titers to them with little or low titers to the new strains. More-

over, some presumably normal ferret sera were found to neutralize the new strains in eggs and mice; the interpretation of this has not been fully established.

Thus, the absence of effect of vaccination during the outbreak of influenza in the spring of 1947 appears to be due to the lack of sufficient antigenic crossing between the strains of virus in the vaccine and the prevalent strain responsible for the epidemic. The implications of this and other observations will be discussed in a more detailed report to be published.

#### REFERENCES

1. Members of the Commission on Influenza, Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army, Preventive Medicine Service, Office of The Surgeon General, United States Army. A Clinical Evaluation of Vaccination Against Influenza. A preliminary report. *J.A.M.A.*, 124:982-985 (Apr. 1), 1944.
2. Members of the Commission on Influenza, Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army, Preventive Medicine Service, Office of The Surgeon General, United States Army. The 1943 Studies of Vaccination Against Influenza: A series of seven papers. *Am. J. Hyg.*, 42:1-105 (July), 1945.
3. Salk, Jonas E., Pearson, Harold E., Brown, Philip N., Smyth, Charley J., and Francis, Thomas, Jr. Immunization Against Influenza with Observations During an Epidemic of Influenza A One Year After Vaccination. *Am. J. Hyg.*, 42:307-322 (Nov.), 1945.
4. Francis, Thomas, Jr., Salk, Jonas E., and Brace, William M. The Protective Effect of Vaccination Against Epidemic Influenza B. *J.A.M.A.*, 131:275-278 (May 25), 1946.
5. Hirst, George K., Vilches, Antonio, Rogers, Orville, and Robbins, Clarence L. The Effect of Vaccination on the Incidence of Influenza B. *Am. J. Hyg.*, 45:96-101 (Jan.), 1947.
6. Salk, Jonas E. A Simplified Procedure for Titrating Hemagglutinating Capacity of Influenza Virus and the Corresponding Antibody. *J. Immunol.*, 49:87-92 (Aug.), 1944.

# Proposed Statistical Classification of Diseases, Injuries, and Causes of Death\*

Prepared by the United States Subcommittee

EDWARD S. ROGERS, M.D., F.A.P.H.A.†

*Professor of Public Health and Medical Administration and Dean, School of  
Public Health, University of California, Berkeley, Calif.*

THE Fifth International Conference for the Revision of the *International List of Causes of Death*, like the preceding conferences, was convened by the Government of France. It was held at Paris in October, 1938. Apart from bringing the previously existing lists up to date in accordance with the progress of science, particularly in the chapter on infective and parasitic diseases, changes in the chapters on puerperal conditions and on accidents and the addition of a list of the causes of stillbirth, the Conference made few changes in the content, number, and even numbering of the items.

The Conference recognized the growing necessity for a corresponding classification of diseases for morbidity statistics to meet the needs of widely differing organizations, such as health insurance groups, hospitals, the military services, and health administrations, and recommended continued studies in this direction.

\* Presented before a Joint Session of the Epidemiology and Vital Statistics Sections of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 13, 1946

† This report is presented by Dr Rogers in the capacity of Chairman of the Subcommittee on the Sixth Revision of the International List of Causes of Death of the Committee on Research and Standards of the American Public Health Association.

The Conference further recommended that the United States Government continue its studies of the statistical treatment of joint causes of death.

In compliance with this recommendation, in 1945 the Secretary of State of the United States appointed the present United States Committee on Joint Causes of Death and requested the Governments of Canada and Great Britain to designate official representatives as members or advisers. Dr. Y. Biraud, Head of the Epidemiological Intelligence Service, Health Section of the League of Nations, also accepted membership on the committee. Two meetings of the full committee have been held in Washington, and a third meeting is scheduled for early next year.

The committee has recognized that its charge to continue the studies of joint cause classification was inseparable from the question of the basic structure of a revised list that could serve as a code for the classification both of causes of death and of morbidity. A special working subcommittee (see page 1071) was appointed, to the members of which belongs the principal credit for the painstaking study and suggestions that are largely responsible for this proposed

classification of diseases, injuries, and causes of death which can be used for both morbidity and mortality statistics.\* This proposed classification has been adopted by the U. S. Committee for further study and possible presentation to the International Conference for its consideration when it meets in 1948.

The classification consists of three parts: Part I is a list of disease categories for the tabulation of morbidity and mortality statistics. It is not suitable for actual coding, since it does not contain either a tabular list of inclusion terms, or an alphabetical index. Part II contains the tabular list of inclusion terms for each disease category. It makes preliminary trials of the code possible. Part III, containing an alphabetical index of diagnostic terms which may appear in medical records and reports, will not be completed until the list is in a definitive form and may not be available until late in 1947 or early 1948.

#### PRINCIPLES UNDERLYING THE PROPOSED CLASSIFICATION

In considering the general principles underlying the proposed morbidity and mortality list, the aim has been to produce a classification for statistical purposes and not a nomenclature of diseases and injuries.

A classification of diseases and injuries designed for both morbidity and mortality statistics must necessarily include more categories than a mortality classification alone. The experience of the committee of the Medical Research Council and that of the U. S. Public Health Service and the U. S. Bureau of the Census in the development of statistical classifications has

shown clearly, however, that the general structure of the *International List* was a useful frame around which a morbidity classification could be evolved. Likewise, the *Standard Morbidity Code* of the Dominion Council of Health of Canada has indicated that the general structure of the *International List* can be followed for morbidity classification. The basic framework of the *International List*, furthermore, has withstood the test of well over a half-century of use in countries throughout the world. The very fact that the general arrangement has not been changed substantially in that time suggests that it would be difficult to improve upon it as a working basis for disease statistics.

Accordingly, the main subdivisions of the proposed classification are, for the most part, the same as the main chapters of the *International List*. Despite this effort at uniformity, a comparison between the frequency of a disease as a cause of death now and twenty years ago is likely to be difficult of interpretation, through no fault of the code, however. Such a comparison would be greatly influenced by the variations in the use of a particular term to describe a disease by observers differing in their education and medical outlook.

#### NATURE OF PROPOSED CLASSIFICATION

The philosophy underlying the proposed classification has of necessity been somewhat eclectic since no single basis or axis of classification is practicable. The proposed classification deals, in sequence, with diseases by cause, with respect to the well defined infective agents, then with neoplasms, general diseases on a somewhat physiologic basis, a long series of diseases according to their principal anatomic site of occurrence, and, finally, with injuries.

An important new form of grouping in certain conditions has been adopted to characterize the late effects or residual

\* Parts I and II, prepared by the Subcommittee on Classification of Diseases, Injuries, and Causes of Death of the U. S. Committee on the Joint Causes of Death, were published in April, 1946, and August, 1946, respectively and are available in limited number through the Federal Security Agency, U. S. Public Health Service, Washington, D. C.

FIGURE 1

- 08 *Diseases attributable to filtrable virus (Part i)*
- 080 Acute poliomyelitis
- 080.0 Specified as bulbar (including polioencephalitis)
- 080.1 With mention of other paralysis
- 080.2 Specified as nonparalytic
- 080.3 Unspecified
- 081 Late effects of acute poliomyelitis
- Specified as a late effect or sequela, or present one year or more after onset

disorders of function which may remain but which are quite distinct from the original disease or injury. Examples in which this method has been adopted are the late effects of poliomyelitis, of rickets, and of injuries (Figure 1).

The proposed classification consists primarily of a reasonably short list of 99 groups and a more detailed list of 742 or 784 categories depending on whether injuries are classified according to the external cause of the injury or to its nature. A decimal system of numbering has been adopted in which the detailed categories are designated by a 3-digit number. The first and second digits of the 3-digit number designate important or summary groups, and the third digit subdivides these into more definite categories that frequently represent specific diseases.

The decimal system represents a departure from the combined number and letter subdivisions that have been used heretofore in the *International List of Causes of Death*. Although the number of definite categories in the proposed classification is substantially larger than in the present *International List*, it is expected that any resultant disadvantage will be more than offset by the greater flexibility and utility of the numbering system suggested.

The proposed classification provides an abridged list of 99 significant groupings which should prove much better adapted to statistical purposes than either of the abridged lists of the current *International List*. One important

advantage of the proposed list lies in the fact that the code for the abridged list constitutes the basic structure for the code for the long list of approximately 750 inclusions as well. This is not the case in the current *International List*, so that either separate punching or code correlation of some sort is required whenever comparison between the long list and an abridgement is made.

Not every condition has received a particular rubric or number, but there is a place or number to which every condition can be referred. This has been achieved by the method of selective grouping. For example, a broad group of conditions such as the psychoses is given a 2-digit number and is then divided into eight categories corresponding to fairly well defined types of psychoses, and, lastly, there is a ninth or residual category to which the psychoses which are not already covered or which are ill-defined can be allocated (Figure 2).

The determination of what conditions should be specified as definite categories has been based on their frequency, importance, and clarity of characterization. The question as to how satisfactory these subdivisions are will be tested under the principle that the number of conditions allocated to residual or ill-defined categories must not be unduly large. Fortunately the proposed classification permits the introduction of new categories without upsetting the basic numbering of other categories. The clerical and mechanical economy of such

FIGURE 2

## V. MENTAL DISEASES, PSYCHONEUROSES, AND PERSONALITY DISORDERS

31 *Psychoses*

Numbers 310-318 exclude general paralysis of insane (025) and puerperal psychosis (648)

- 310 Dementia praecox (schizophrenia)
- 311 Manic-depressive psychosis
- 312 Involutional psychosis
- 313 Paranoia and paranoid conditions
- 314 Senile psychosis
- 315 Psychosis with cerebral arteriosclerosis
- 316 Alcoholic psychosis
- 317 Toxic or infective psychosis

This title is not to be used for primary death classification if the antecedent condition is known. It is not to be used for primary morbidity classification if the antecedent condition is present.

- 318 Other and unspecified psychoses

a possibility is of particular importance to statistical organizations which handle large volumes of records.

The numbering system has been designed purposely as a closed system; that is, the third digit categories under each 2-digit group begin with "0" and continue consecutively for the number of categories in that group. No vacant numbers are left except at the end of the 3-digit subdivisions. Thus the detailed classification represented by the code must remain uniform to the third digit.

Many of the 3-digit categories are further divided into more detailed sub-categories, often on a different axis of classification (Figure 3). The numbers for these sub-categories represent decimal subdivisions of the 3-digit code. These sub-categories may be considered optional. Whenever more detailed ter-

minology than that provided in the classification is required, the fourth digit place should be used. If such fourth digit sub-classes are created it is recommended by the committee that letters instead of numbers be used. This will serve to distinguish such particularized inclusions from the items that comprise the standard list in international use.

## COMPARISON WITH CURRENT INTERNATIONAL LIST

In the proposed scheme, there are 17 main sections as compared with 18 in the *International List*. There are 99 2-digit groups in the proposed list and approximately 750 3 digit categories. These may be compared with the abridged *International Lists* of 44 or 87 titles and with 200 categories and approximately 450 sub-groups of the complete *International List*.

FIGURE 3

07 *Spirochetal diseases, except syphilis*

- 070 Vincent's infection
- 071 Relapsing fever
  - 071.0 Louse-borne
  - 071.1 Tick-borne
  - 071.2 Unspecified
- 072 *Leptospiriosis icterohemorrhagica* (Weil's disease)
- 073 Yaws
- 074 Other spirochetal infections, except syphilis

FIGURE 4

*Comparison of Main Sections, International List of Causes of Death (5th Revision) and Proposed Statistical Classification of Diseases, Injuries and Causes of Death*

Section	International List	Proposed Statistical Classification
I	Infectious and Parasitic Diseases	Infective and Parasitic Diseases
II	Cancer and Other Tumors	Neoplasms
III	Rheumatism, Diseases of Nutrition and of the Endocrine Glands, Other General Diseases, and Avitaminoses	Allergic, Endocrine, Metabolic, Nutritional and Other General Diseases
IV	Diseases of the Blood and Blood-forming Organs	Same
V	Chronic Poisoning and Intoxication	Mental Diseases, Psychoneuroses, and Personality Disorders
VI	Diseases of the Nervous System and Sense Organs	Same
VII	Diseases of the Circulatory System	Same
VIII	Diseases of the Respiratory System	Same
IX	Diseases of the Digestive System	Same
X	Diseases of the Genito-urinary System	Same
XI	Diseases of Pregnancy, Childbirth, and the Puerperium	Deliveries and Complications of Pregnancy, Childbirth and the Puerperium
XII	Diseases of the Skin and Cellular Tissue	Same
XIII	Diseases of the Bones and Organs of Movement	Same
XIV	Congenital Malformations	Same
XV	Diseases Peculiar to the First Year of Life	Diseases Peculiar to the First Month of Life
XVI	Senility	Senility and Ill-defined Conditions
XVII	Violent or Accidental Deaths	Accidents and Violence
		N = Classification by Nature of Injury or Poisoning
		E = Classification by External Cause

Although for the purpose of maintaining continuity of mortality statistics the important titles of the current *International List* have been retained, it did not seem essential that there should be strict comparability for each subdivision. However, in so far as is practicable the order of the diseases follows that of the *International List* with the addition of diseases, usually items concerned with morbidity rather than mortality, that were not given a specific place before.

Comparison of the main section headings of the two lists shows the following proposed changes:

Section V, "Chronic Poisoning and

Intoxication," of the *International List* has been eliminated and the conditions included in the three groups of that section are assigned elsewhere in the proposed list, principally under the revised section on "Accidents and Violence." In the place of the former Section V, a new section on "Mental Diseases, Psychoses, and Personality Disorders," has been established.

The heading of Section XI has been reworded to include normal pregnancy and delivery.

Section XVI, "Senility," and Section XVIII, "Ill-defined and Unknown Causes," have been combined in a single section, also Section XVI, under

the heading of "Senility and Ill-defined Conditions." Section XVIII has not been continued.

For Section XVII, "Accidents and Violence," the committee has adopted a dual system of classification. This section has always been one of the most troublesome in the *International List*. The difficulties have arisen over the two axes of classification that are of particular statistical interest; namely, circumstances of accident or means of injury, and nature of injury. Each of these represents an important aspect of injuries although in a particular analysis one axis may be more valuable than another. As a consequence this section has always represented compromises which frequently were quite unsatisfactory because they answered neither one problem nor the other and, furthermore, the terms often were not mutually exclusive.

In developing this proposed code for both morbidity and mortality statistics, the problem of Section XVII has been attacked boldly and a dual classification suggested. One classification is on the basis of the nature of the injury, the other on the means of injury or the so-called, "external cause." In order to distinguish which classification is used the letter "N" has been placed before the code numbers of the first arrangement and the letter "E" placed before the second. Both classifications should be considered as integral parts of the "Proposed Statistical Classification of Diseases, Injuries and Causes of Death."

Too much importance should not be attached to the broad section headings of the proposed code as these 17 group

titles are not included in the numbering scheme of the code itself. Although they serve as useful guides to an orderly grouping of the inclusions of the list, the committee considers that the similar broad headings of the current *International List* do not represent a collection of disease conditions that is sufficiently consistent with any single axis of classification to be either statistically stable or functionally useful. Every revision in the past has shifted diseases from one section to another in such a fashion that the groups have seldom remained comparable over long periods of years. The section headings have been retained, however, as they show the general structure of the proposed classification and its similarity to that of the *International List*.

The proposed classification is ready for preliminary and unofficial study and trial by interested agencies in this country and elsewhere. Another meeting of the committee will be held early in 1947, at which time consideration will be given to all comments and suggestions concerning the structure of the proposed list and its usefulness as a single code for both mortality and morbidity statistics.

As chairman of the Subcommittee on the Sixth Revision of the International List of Cause of Death of the Committee on Research and Standards of the American Public Health Association, I particularly wish to invite your interest and careful review of this proposed classification. The Association has not only a duty to discharge, but also a strong tradition of national and international leadership to maintain in connection with this fundamental activity.

# Bacteriological Procedures in Sanitary Air Analysis\*

## SPECIFIC BACTERIOLOGIC PROCEDURE

A JOINT meeting of the Subcommittee on Bacteriological Procedures with the Committee on Air Sterilization and Odor Control of the American Society of Heating and Ventilating Engineers was called on June 4, 1945, in New York City to consider routine procedure for a sanitary survey of ventilation in accordance with six suggestions offered by Professor Winslow for establishing sanitary ventilation on a design basis; these procedures, adopted at a previous meeting on January 22, 1945, follow:

1. Obtain agreement on a method of determining the number of streptococci present in air.
2. Establish a standard of performance and state the permissible number of streptococci per cubic foot of acceptably clean air.
3. Establish the concentration of streptococci which may be found in various types of occupied rooms under average and under extreme conditions such as obtained during a cold epidemic.
4. Establish the number of air changes required to reduce the various degrees of pollution to an accepted standard by means of outside or purified, recirculated air.
5. Establish a basis on which to determine the cost to obtain the desired standard condition by the use of ultra-violet light or a combination of ultra-violet light and air change.
6. Determine the cost of obtaining standard conditions by use of aerosols sprayed into the

air for comparison with cost to produce the same standard condition by means of proper air change and ultra-violet radiation.

Bacteriologic Procedure in the Evaluation of Methods of Control of Airborne Infection (Wells, Winslow, and Robertson, 1946) were thoroughly discussed and it was agreed that specific procedures would be submitted to the subcommittee for approval. The following resolutions were adopted:

VOTED: THAT the ASHVE T.A.C. on Air Sterilization and Odor Control recommends to the Committee on Research that funds be allocated to enable a Sanitary Survey in accordance with the "Bacteriologic Procedures in Sanitary Air Analysis" to be undertaken under the auspices of the Committee, and THAT the Wells centrifuge be used as the collecting device for at least the first survey that is made.

VOTED: THAT this Joint Committee recommends to the ASHVE Committee on Research the steps suggested by Dr. Winslow as a basis for procedure for carrying out a Sanitary Air Survey.

At a meeting in New York on September 22, 1945, it was agreed that for the time being the specific bacteriologic procedure now being applied in a comprehensive sanitary survey of ventilation in schools by the New York State Department of Health (as described below) would be adopted tentatively.

It was further agreed that sampling devices should be compared.

First, samplers for sanitary air analysis should be capable of collecting nuclei from droplets coughed or sneezed into the atmosphere—proved for the air centrifuge (Wells and Riley, 1937,

\* Report of the Subcommittee on Bacteriological Procedures of the Special Committee on Standard Methods for the Examination of Air, administered by the Committee on Ventilation and Atmospheric Pollution. Published subcommittee reports, *Year Books*, 1936-1937, 1937-1938, 1938-1939, 1939-1940, 1940-1941, 1941-1942.



and Phelps and Buchbinder, 1941), and for the slit sampler (Bourdillon, Lidwell, and Thomas, 1941)—by removal from 10 cubic feet of air of more than 100 times as many nuclei of atomized cultures as deposit on a Petri plate in 10 minutes. The test is easily performed by atomizing into the air of a room with a Fragrantmist\* vaporizer a diluted culture of *Escherichia coli* and testing the air with sampling instruments, simultaneously with Petri plate exposure.

Second, it was agreed that suggested media should be compared with those now being used by the New York State Department of Health for the culture of significant organisms.

Third, the practicability of methods in field investigations as well as in laboratory studies should be compared.

#### TENTATIVE PROCEDURES OF SANITARY AIR ANALYSIS USED BY THE NEW YORK STATE DEPARTMENT OF HEALTH

##### Apparatus

The Wells Air Centrifuge adjusted to deliver one cubic foot of air per minute shall be used to collect samples in both liquid and solid media.

Special Pyrex centrifuge tubes for use with the Wells centrifuge shall be used to collect all samples taken in the centrifuge.

Petri plates 10 cm. in diameter with glass tops shall be used.

##### Media

(F<sub>1</sub>) Tryptose agar † (for use in Petri plates and centrifuge tubes)

Agar	2.0	per cent
Beef extract (Bacto)	0.3	" "
Tryptose	0.5	" "
Dextrose	0.1	" "
Water to make	100	" "

\* Manufactured by Walton Laboratories, Inc., Irvington, N. J.

† This agar is similar to that used for examination of milk (A.P.H.A. and A.O.A.C., 1941) except that skim milk is not added, and the agar concentration is increased to provide a stiffer medium for use in the centrifuge tubes.

(F <sub>2</sub> ) Air enrichment broth (Difco formula)	
Tryptose	1.0 per cent
Proteose-peptone No. 3	0.7 " "
Yeast extract	0.3 " "
Lactose	0.5 " "
Disodium phosphate	0.25 " "
Brom thymol blue	3 ml./lit. of 0.4 per cent sol.
Gentian violet	1:4,000,000

(F<sub>2</sub>) Gentian violet blood agar

(F<sub>2</sub>) containing 2.0 per cent agar, 2 p.p.m. gentian violet and blood (rabbit or horse) 50 gr./900 ml.

(F<sub>4</sub>) Beef-infusion broth (for streptococci, Wadsworth, 1939)

Beef	450 grams
Water	1000 "
Peptone (Difco Proteose)	20 "
Dextrose	0.02 per cent

##### Sampling

The samples shall be collected in rooms which have been in normal use for not less than 1 hour before sampling. Temperature, humidity, number of persons and their activity shall be recorded, together with the previous attendance during the 20 minutes directly preceding the test. The number of windows open and the number, position, and apparent operation of any germicidal units, such as ultra-violet lights, shall also be recorded.

Five Petri plates, previously poured, containing tryptose agar (F<sub>1</sub>) shall be exposed simultaneously for 15 minutes. One of these plates shall be placed approximately 2 feet from each corner and one in the center of the room; all shall be supported 30 inches above the floor. During this 15 minute period, one 5 minute centrifuge sample shall be taken in 20 ml. of agar medium (F<sub>1</sub>) poured from a thermos bottle and cooled to about 55 °C. before placing in the centrifuge.

During the same 15 minute period another 5 minute centrifuge sample shall be taken in 20 ml. of air enrichment broth (F<sub>2</sub>).

##### Incubation and counting

The exposed plates and agar tubes

shall be incubated for 18-24 hours at 37° C. They shall be counted with a Quebec colony counter, or other suitable device. If a centrifuge tube contains more than 300 colonies, a fractional part may be counted, but this fraction must include an entire lengthwise section of the tube.

The exposed broth in the centrifuge tube shall be divided into five equal portions, each representing the bacteria contained in one cubic foot of air. These shall be incubated for 24 hours at 37° C. at which time any tubes which have a yellow color shall be streaked on blood agar ( $F_3$ ). All tubes which show no yellow shall be reincubated for another 24 hours and any yellow tubes appearing at that time shall also be streaked on blood agar, containing 1:500,000 gentian violet. The blood agar plates shall be incubated for 48 hours and observed for *alpha* or *beta* hemolytic colonies. Any such colonies shall be fished to streptococcus broth ( $F_4$ ), incubated for 24 hours at 37° and examined, using the Gram stain.

To obtain the settling count per square foot per minute, the median of the counts of the five Petri plates shall be taken.

The volume count per cubic foot equals the centrifuge count divided by 5.

The broth shall be reported as number of tubes positive and number negative.

Petri plates  
Tripod Petri plate holders—30 inches high  
Pint thermos bottles  
Pouring stoppers for thermos bottles  
100 x 15 test tubes (sterile)  
37° incubator  
Quebec colony counter  
Hand tally  
Sterile 10 ml. pipettes graduated in 1/10 ml.  
Loop  
Needle

### Sanitary Ventilation Test

4 Fragrantmist Atomizers  
3 25 ft. leads  
1 tube colony counter  
(in addition to equipment listed above)

### REFERENCES

- American Public Health Association. *Standard Methods for the Examination of Water and Sewage*. 8th ed., 1936.
- American Public Health Association and Association of Official Agricultural Chemists. *Standard Methods for the Examination of Dairy Products*. American Public Health Association, 8th ed., 1941, p. 23.
- Bourdillon, R. B., Lidwell, O. M., and Thomas, J. C. A Slit Sampler for Collecting and Counting Air-borne Bacteria. *J. Hyg.*, 41:197-224, 1941.
- Phelps, E. B., and Buchbinder, L. Studies on Micro-organisms in Simulated Room Environments: I. A Study of the Performance of the Wells Air Centrifuge and of the Settling Rates of Bacteria through the Air. *J. Bact.*, 42:321-344, 1941.
- Wadsworth, A. B. *Standard Methods of the Division of Laboratories and Research of the New York State Department of Health*. Baltimore: Williams & Wilkins, 2nd ed., 1939, p. 87.
- Wells, W. F. Bacteriologic Procedure in Sanitary Air Analysis, with Special Reference to Air Disinfection. *J. Bact.*, 46:549-557, 1943.
- Wells, W. F., and Riley, E. C. An Investigation of the Bacterial Contamination of the Air of Textile Mills with Special Reference to the Influence of Artificial Humidification. *J. Indust. Hyg. & Toxicol.*, 19:513-561, 1937.
- Wells, W. F., Winslow, C.-E. A., and Robertson, E. C. Bacteriologic Procedures in the Evaluation of Methods for Control of Air-borne Infection. *A.J.P.H.*, 4:324, 1946.

W. F. WELLS, *Chairman*  
C. T. BUTTERFIELD  
F. W. GILCREAS  
E. C. ROBERTSON, M.D.  
C.-E. A. WINSLOW, DR.P.H.

### EQUIPMENT FOR AIR SANITATION STUDY *Sanitary Air Analysis*

Wells air centrifuge  
25 ft. electric lead  
Centrifuge tubes for Wells centrifuge (sterile)

# Yellow Fever Vaccination, Simple or Associated with Vaccination Against Smallpox, of the Populations of French West Africa by the Method of the Pasteur Institute of Dakar

MÉDECIN-GÉNÉRAL MAURICE PELTIER

*Dakar, French West Africa*

THE absence of yellow fever in the French territories of West Africa is now almost entirely the result of mass vaccinations of both the European and native population. Since 1941, about 15 million vaccinations were performed—a figure which corresponds almost to the total populations under census in those territories.

A control campaign of such magnitude has only been possible on account of the simplicity of the method of preparation and application of the vaccine used. The method was developed at the Pasteur Institute of Dakar by Messrs. M. Peltier, C. Durieux, H. Jonchere, and E. Arquie. The difficulties of war times rendered impossible any widespread publication of these important works, and it seems appropriate now to draw attention to them.

The first experiments with this mode of vaccination date from 1939 and the papers relating to them have been published in the French scientific journals.<sup>1,2</sup> Vaccination against yellow fever, however, had been practiced in the French territories of Western Africa since 1934, the vehicle being the

neurotropic virus of the mouse, first by the procedure of Sellards-Laigret (vaccine phosphate in three injections), and later by the Laigret process (vaccine phosphate mixed with egg yolk). This mode of vaccination proved its efficacy, but the practical difficulties involved were an obstacle to its large diffusion.

Convinced that only the vaccination of the native masses could remove the danger of propagation of yellow fever, the Pasteur Institute of Dakar sought a simpler method which could be more easily given wide application. Its primary object was to replace subcutaneous inoculation, which requires a considerable number of syringes and needles rigorously sterilized, with inoculation by the simple application of virus to cutaneous scarifications.

The passage of the pantropic virus to the organism through contact with the shaven or scarified skin had been obtained previously in the *Macacus rhesus* in 1928 by H. Beeuwkes<sup>3</sup> and also by E. Marchoux.<sup>4</sup>

The Pasteur Institute of Dakar experimented with the process of penetration of the neurotropic virus of the

mouse through scarification. The first experiments were made in November, 1938, on young *Macacus rhesus* monkeys. The virus utilized was the neurotropic virus of the French strain at the 238th passage.

One drop of a glycerine suspension of the powder of the dried virulent mouse brain was deposited upon scarifications made on the abdomen. The virus was detected in the blood of the animals from the 4th to the 8th days. No febrile reaction was observed. The test of sero-protection made 30 days after the experiment proved strongly positive.

The same procedure was then repeated on man and the results were identical. For the first six subjects who were thus inoculated (all volunteers), the virus was found in the circulation around the 4th, 5th, or 6th day after vaccination. Only one showed a slight reaction of fever during the 7th day. Subsequent tests in all the series gave positive sero-protection.

Thus the idea occurred of associating the yellow fever virus with the Jennerian virus in order to achieve with only one operation a combined vaccination against yellow fever and smallpox.

The two vaccine viruses were mixed at the moment of application and suspended in glycerine. The combined vaccinations were performed first on the *Macacus rhesus* and then on man. On the latter, the operations were performed in the beginning under environmental conditions that facilitated surveillance, in the Navy at Dakar and in the village schools; and subsequently, attention was gradually directed to subjects of both sexes and all ages, including more than 50 children from six months to one year old. A test for sero-protection made before the experiment made it possible to retain only those subjects who presented a negative test. No severe reaction was observed,

except in some cases a slight feverish condition.

The sero-protection test performed a month later showed that immunity against yellow fever had been acquired in 90 per cent of the cases.

On the other hand, all the subjects that were receptive to the smallpox vaccine virus presented vesicles in the same proportion as those observed when the same vaccine was used alone, that is, in 16 per cent of subjects already vaccinated several times against smallpox and 81 per cent of subjects supposedly never before to have been vaccinated. The antivariolic vaccine used in this experiment, which was performed on 741 persons, was prepared from a culture made by H. Plotz.

These first experiments led to the following definite conclusions:

1. The neurotropic yellow fever virus applied to cutaneous scarifications penetrates into the organism and produces immunity against yellow fever.

2. The association of the neurotropic antiamarillic virus with the antivariolic vaccine makes it possible to obtain protection against both yellow fever and smallpox.

3. The two immunities establish themselves simultaneously and independently of each other in the same manner as they would under two separate vaccinations.

However, before making current practice of this method of vaccination in the African bush, the Pasteur Institute of Dakar decided to make sure once more that the neurotropic virus present in the peripheral circulation a few days after vaccination could not, through passage by the *Stegomyia*, regain its pantropic properties and bring about outbreaks of yellow fever in the neighborhood of the vaccinated subjects.

Already a certain number of authors had observed that the neurotropic virus, after a great number of mouse passages, does not pass easily to the mosquito, and, whenever it happens to pass, there

is no evidence that the strain returns to its original viscerotropic types.<sup>5-9</sup>

The Pasteur Institute thought it advisable, nevertheless, to pursue the experiments to a conclusion by working under optimum conditions, *i.e.*, by operating in Dakar during the season which is the most favorable to the development of the natural infection of that mosquito—the hot and humid part of the year which is the yellow fever season in Senegal.

The results of this last experiment were published in March, 1939.<sup>10</sup> Even under those optimum conditions, it has been confirmed beyond any doubt that:

1. It is almost impossible for the neurotropic virus to develop or even to maintain itself in the *Stegomyia*.

2. When, by any chance, the neurotropic virus is so maintained the *Stegomyia* is unable to transmit it by biting, even to the most sensitive of the animals—the *Macacus rhesus*—and much less to man.

In view of the above results, a vaccination campaign comprising 100,000 inhabitants of Senegal was authorized and undertaken during the months of May, June, and July, 1939. Those vaccinations were performed in a region where no case of yellow fever had been noticed for a long time, with a view to observing more easily any accidents that might occur both among the vaccinated individuals and their neighbors. The vaccines were very well tolerated. The neighboring population was very carefully observed, and no manifestation of yellow fever, not even the slightest, has been noticed despite the prevalent breeding of the *Stegomyia*.

The results of the vaccination against smallpox were controlled 8 days after performance. The tests for sero-protection, carried out only on subjects who had had negative tests before the experiment, followed 6 weeks after vaccination. Among the 1,630 sera thus tested, 1,559 were found positive, or 95.6 per cent.

Other mixed vaccination campaigns embodying scores of thousands of inhabitants of the Ivory Coast and the Sudan were carried out in 1940 and 1941 under the direction of the Pasteur Institute of Dakar with the coöperation of the personnel of the Assistance Medical Indigene (Office of Medical Assistance to the Natives). The results obtained were as good as those secured in the first experiments.<sup>11-12</sup>

The facility and safety of the new method having thus been established, and in view of the numerous dangers confronting the troops stationed in French West Africa, the public authorities decided in the latter part of 1941 to make vaccination against yellow fever by the method of the Pasteur Institute of Dakar compulsory for all the military and civilian populations of those regions. It was further decided that the yellow fever vaccination should be associated with the vaccination against smallpox each time the administration of the latter was deemed necessary.

The Services d'Hygiene et de Prophylaxie (Bureau of Public Health and Prophylaxis) were already organized to administer vaccinations to all the native population within a period of 4 years. A 4 year plan of mixed vaccinations was then started and carried almost to completion, in spite of all the difficulties inherent in the war and post-war periods of 1942-1946. On January 1, 1946, the total of simple and mixed vaccinations against yellow fever reached the figure 14,330,735 for a total population of about 16 million inhabitants.

Table 1 gives the details for each annual operation.

These results were submitted to the Quarantine Commission of UNRRA by Surgeon General Peltier. It was agreed that an experimental study would be made under the auspices of UNRRA in order to ascertain the value of the pro-

cedure so as to permit the eventual official recognition of the Dakar method of immunization in the matter of international sanitary regulations.

This experiment took place in France

TABLE 1

*Yellow Fever Vaccinations by Scarification  
Civilian Population*

*(Total French West Africa and Togo)*

*Population = About 16 Million Inhabitants*

	<i>Simple Vaccine</i>	<i>Mixed Vaccines</i>	<i>Total</i>
1939	2,760	98,873	101,633
1940	64,982	232,675	297,657
1941	371,097	1,128,868	1,499,965
1942	281,468	2,585,340	2,866,808
1943	459,339	2,475,883	2,935,222
1944	391,066	3,265,510	3,656,576
1945	538,684	2,434,190	2,972,874
Total	2,109,396	12,221,339	14,330,735

NOTE: The total, taken on December 21, 1945, of the yellow fever vaccinations performed among the Military (Navy and Air Corps included) amounted to 232,357.

in July, 1945, in accordance with the protocol drafted by the experts of the Quarantine Commission and accepted by the French sanitary and military authorities. It was performed on 600 men of a division destined for the French Expeditionary Corps of the Far East. The men chosen had never been out of France nor had they ever been submitted to any vaccination against yellow fever. Their ages varied from 21 to 30 years.

The subjects were divided into three groups, as follows:

*Group A:* To be immunized by scarification with yellow fever vaccine prepared by the Pasteur Institute of Dakar.

*Group B:* To be immunized by scarification with the Dakar yellow fever vaccine mixed with the vaccine against smallpox.

*Group C:* To be immunized by hypodermic inoculation with vaccine 17-D.

All of the said operations were performed in the presence of representatives of the UNRRA Commission.

The reactions were very carefully observed. It was agreed that the in-

oculated men should continue to lead a normal life but would, from the military point of view, be kept almost at rest for a period of one week, particularly on the 4th and 5th days after vaccination.

These prescriptions were followed in regard to the groups B and C, which showed only the usual slight reactions to such operations, namely, a rise of temperature and headache, in about 10 per cent to 12 per cent of the cases.

On the other hand, the men constituting Group A, due to some misunderstanding, were subjected to a severe physical effort which included a march on foot of 15 kilometers on hilly terrain and a stop of several hours in the hot sun. This fact presumably was responsible for the reactions observed on the 4th and 5th days, which were much more numerous—up to 35 per cent of the subjects. No serious reaction, however, was registered.

As regards the results of the vaccination against smallpox (Group B), 36 definite reactions characterized by the development of vesicles, were noted. We thus had 16 per cent of positive results, which is indeed a very good proportion since all the subjects had already been vaccinated against smallpox several times before. The vaccine used was the dried vaccine of the Institut de Vaccine de Paris (Vaccine Institute of Paris).

In order to determine the results of the yellow fever vaccination, blood samples were taken 35 days after inoculation. Moreover, blood serum was obtained also from 30 non-vaccinated men of the same regiment who had never been out of France.

Each sample of serum was divided between three ampoules, of which one was destined for the Pasteur Institute of Dakar, and the other two for UNRRA. The laboratories did not know the origins of the sera.

Finally, UNRRA announced that on

the subjects who had received the yellow fever vaccine of Dakar alone, the sero-protection test had been positive in 98.94 per cent of the cases. On the subjects that had received the yellow fever vaccine of Dakar and the vaccine against smallpox at the same time, the sero-protection test was positive in 97.93 per cent of the cases.

Consequently, in accord with the opinion expressed by the Quarantine Commission, the Standing Technical Committee on Health of UNRRA unanimously decided to acknowledge the validity of the vaccine of the Pasteur Institute of Dakar from the international standpoint.

The following are the details of the preparation and utilization of the vaccine:

#### 1. *Preparation of the Vaccine*—

The virus used is of the French strain which has actually been carried to the 256th–258th passage in mouse brain. A dried mouse brain preserved in vacuum and cold storage is finely ground up in 5 ml. of physiological salt solution. The resulting suspension is centrifuged and the supernatant fluid is inoculated in doses of 0.03 ml. into as many mice as necessary. Only those mice that show definite paralysis on the 4th and 5th days after inoculations are sacrificed. The brains are then removed. Controls for sterility are made by inoculating culture media under aerobic and anaerobic conditions. Each brain is placed in a numbered small glass tube placed in a refrigerator at  $-25^{\circ}\text{C}$ .

When all the brains have been removed and frozen, they are placed in a vacuum chamber with calcium chloride and put into the refrigerator at  $-25^{\circ}\text{C}$ . The vacuum chamber is connected with an oil pump which produces a vacuum and permits perfect desiccation after a period of 3 to 4 days.

The dried brains known to be sterile are very finely ground in a mortar, alone

at first, and then with infusorial earth, to which powdered Kaolin is later added. To one measured volume of brain powder two volumes of sterile inert powder are added. The mixture thus obtained is again dehydrated under vacuum at  $-25^{\circ}\text{C}$ . for 24 hours. A second test for sterility is made.

The powder, verified sterile, is then divided between ampoules with the aid of a measuring spoon. Each measuring spoon corresponds to 1/10 of a brain and represents 100 doses of vaccine, each whole brain thus giving 1,000 doses of vaccine. The vaccine titer is the amount which will kill a mouse with regularity at a dilution corresponding to one part fresh virus in one million parts.

The ampoules of vaccines, sealed under vacuum, are stored at a temperature of  $-4^{\circ}\text{C}$ . The potency of the vaccine persists for 2 months after leaving the laboratory, provided it is kept in an icebox. The vaccine may be transported at ordinary temperatures, if for not more than several days.

#### 2. *How to Use*—

At the moment of using, the contents of an ampoule of 100 doses is poured into a mortar. There is then added, drop by drop, 2 ml. of a gum solution, stirring continuously with a shaker. The gum solution has proved to be far superior to glycerine. In fact, the gum is much less fluid and dries rapidly. After two to three minutes, a thin film is formed which keeps the virus fixed upon the scarified region. The solution used is of gum arabic harvested in Senegal, saturated, rigorously neutralized, filtered, and sterilized.

For the mixed vaccination, the anti-smallpox vaccine virus most generally employed is the dried vaccine prepared by the Vaccine Institute of Paris. The two viruses are carefully mixed in the mortar before the admixture of the gum solution.

The precautions to be taken at the gatherings for vaccination are the same as those recommended for the practice of Jennerian vaccination in the tropical regions. The vaccination campaigns ought to be carried out, as far as possible, during the least hot seasons, at the first hours of the day and *always* in the shade.

With the vaccine style, two drops of vaccinal suspension are deposited on the deltoid region. Through each drop, two parallel scarifications of 0.5 cm. in length are made. Surveillance of the vaccinated persons should be exercised for about 5 minutes to make sure that they do not wipe off the vaccine. When the gum has dried entirely, the surveillance may cease.

It is, therefore, evident that the operation is very simple, requiring a minimum of material, and that it can be carried out in the shortest space of time. Finally, this method of scarification is in general well accepted by the African population, who, on the other hand, often fear the subcutaneous injections.

Those are the reasons that assured the success of the method of the Pasteur Institute of Dakar. French Africa is beginning to reap the fruits of the effort. The cases of recognized yellow fever have progressively decreased despite the regular investigations made concerning all febrile affections more or less suspected and the practice of viscerotomy.

Thus there were 17 confirmed cases in 1941, 10 in 1942, 12 in 1943, 2 in 1944, only one doubtful case in 1945, and none at all during the first semester of 1946. Among these cases of yellow fever, 6 were in individuals who were supposed to have been vaccinated by the Dakar method.

It is probable that almost all of these cases have to do with persons hostile to the vaccination who deliberately wiped off the vaccines immediately after the

scarification. In the majority of the cases the virus had been placed in suspension in glycerine and not in gum.

It is, therefore, essential that the operations of vaccination be well organized and supervised. Actually, this service is well organized and the results seem to indicate that the large majority of the inhabitants of the regions in which vaccination has been practised are definitely in a state of immunity against yellow fever virus.

An inquiry has just been made concerning the native populations of two villages of Senegal, one having been vaccinated four years ago, and the other seven years ago. For the first village, 85.9 per cent of the 106 sera taken at random showed a positive sero-protection test (after four years). For the second village, vaccinated seven years ago, there were 82 per cent positive tests among 72 sera taken.

These results of long duration obtained in the bush, far from the conditions realized in the laboratory, are excellent and indicate the confidence one may place upon the wide use of the above mentioned method, carried out with the periodicity of vaccinations every four years.

#### REFERENCES

1. Peltier, M., Durieux, C., Jonchere, H., and Arquie, E. Penetration du virus amaril neurotrope par voie cutanee. Vaccination mixte contre la Fievre Jaune et la variole. (Note Preliminaire) *Bull. Acad. de med., Paris*. Meeting May 9, 1939, Vol. 12, 17:657, 1939.
2. Peltier, M., Durieux, C., Jonchere, H., and Arquie, E. Vaccination mixte contre la Fievre Jaune et le variole sur des populations indigenes du Senegal. *Bull. Acad. de med., Paris*. Meeting Dec. 20, 1940 Vol. 123, 7-8:137, 1940.
3. Beeuwkes, H. Conference de la Fievre Jaune, Dakar, 1928.
4. Marchoux, E. *Compt. rend. Acad. d. sc.*, 187: 260, 1928.
5. Roubaud, E., and Stefanopoulo, G. *Bull. Soc. path. exot.*, 26:305, 1933.
6. Davis, Nelson, Lloyd, Wray, and Frobisher, Martin. The Transmission of Neurotropic Yellow Fever virus by *Stegomyia* Mosquitoes. *J. Exper. Med.*, 56:853-865, 1932.
7. Mathis, C., Durieux, C., and Advier, M. La vaccination antiamarile comporte-t-elle des dangers dans les regions ou le Fievre Jaune renit endemiement et ou les *Stegomyias* abondent? Meeting Nov. 6, 1934. *Bull. Acad. de med., Paris*, 112, 35:387, 1934.



8. *Ibid.* (Second note) Meeting Dec. 3, 1935, 114, 39:510, 1935.

9. Mathis, M. Sur le pouvoir infectant des *Macacus rhesus* vaccines contre la Fievre Jaune. *Bull. Soc. path. exot.*, 26, 311 (Feb.), 1933.

10. Peltier, M., Durieux, C., Jonchere, H., and Arquie, E. La Transmission par piqure de *Stegomyia*, du virus amaril neurotrope present dans le sang des

personnes recemment vaccinees, est-elle possible dans les regions ou ce moustique existe en abondance? *Rev. de Immunol.*, 2:172-175 (Mar.), 1939.

11. Peltier, M. Vaccination antiamarile simple ou associee a la vaccination antivariolique par scarification. *Med. Tropicale*, 1st year, 1941, No. 5.

12. Durieux, C. *Rapports de l'Institut Pasteur de Dakar*, 1941-1942.

---

## Chinese Public Health Association Is Established

The Chinese Public Health Association was organized in May, 1947, during the Nanking meeting of the Chinese Medical Association with which the new group is affiliated, although it is an autonomous association of public health workers in China, including engineers, nurses, and others outside the medical profession. P. Z. King, M.D., the Vice Minister for Public Health, was elected President, and the Secretary is Yü Huan-wen, M.D., Professor of Public Health, National Central Medical College, Nanking.

It was reported at the meeting of the association that the Chinese translation of the report on the Control of Communicable Diseases, published through

six editions by the American Public Health Association, had been translated into Chinese. This report has been adopted as an official statement by the National Health Administration of China. It was recalled that much of the text of this report had been prepared in agreement with representatives of the medical staff of the British Ministry of Health, that the epidemiologic information contained in the report had been approved for distribution through U.N. R.R.A. channels, that the text had been approved in principle by the American Red Cross, and by the Surgeon General, United States Army, and that it is official with the U. S. Public Health Service and United States Navy.

# Allergy in Brucellosis\*

ALBERTO P. LEÓN, M.D., M.P.H., F.A.P.H.A., AND  
JOSÉ SOSA, Q.B.P.

*Laboratory of Bacteriology and Immunology, Institute of Health and  
Tropical Diseases, Mexico City, Mexico*

SINCE the work of Fleischner and Meyer<sup>1</sup> in 1918, and of Burnet<sup>2</sup> in 1922, it was established that *Brucella* infections, like tuberculosis, elicit a state of allergy which can be detected by an intradermal reaction with bacterial extracts, as did the former, or with broth culture filtrates, as did the latter of these authors. Burnet found that this reaction could be used for the diagnosis of brucellosis, and this finding was confirmed by many authors after him. Tapia and del Valle<sup>3</sup> in 1928, by making a comparative study in cases of brucellosis and controls, observed that *Brucella* suspensions could be used for the same purpose and that this antigen was probably more specific. A complete review of the literature on this subject has been made by Leavell and Amoss<sup>4</sup> up to 1931, to whose paper the interested reader is referred. The bacterial suspension was found to be a superior antigen to the broth culture filtrate, in the diagnosis of brucellosis, by Mitra,<sup>5</sup> Fornaco and Bua-Fazio,<sup>6</sup> de Fermo,<sup>7</sup> Giordano,<sup>8</sup> and others. Leavell and Amoss (*loc cit.*) made intracutaneous tests in a small group of cases of undulant fever and in controls using as antigens bacterial suspensions, saline bacterial extracts, a soluble substance prepared according to the methods described for streptococci by Lancefield,<sup>9</sup> and Ando,<sup>10</sup> and a broth culture filtrate. They concluded that heat-killed

bacterial suspensions seem to have more specific action than bacterial filtrates. Notwithstanding, several authors have preferred to use bacterial antigenic fractions rather than the whole bacterial cell for the skin test in the diagnosis of brucellosis. Huddleson, Johnson, and Hamann<sup>11</sup> have employed the nucleoprotein fraction which they call brucellergen. This substance has been used by Keller, Pharris, and Gaub,<sup>12</sup> by Angle, Algie, Baumgartner, and Lunsford,<sup>13</sup> by Memfee and Poston,<sup>14</sup> and by others with satisfactory results. Some authors have objected to the use of bacterial suspensions because of the severe reactions which are induced, particularly the abscess formation at the site of the injection. This in our opinion is due to the large doses which have been employed.

Yeckel and Chapman<sup>15</sup> have used concentrations as turbid as No. 1 of the nephelometer of barium sulfate; McBryde, Daniel, and Poston<sup>16</sup> used bacterial suspensions standardized by comparison of turbidity with the 1:1,000 U. S. Public Health Silica Standard diluted farther 1:15; Goldstein<sup>17</sup> has employed a suspension with 500 million bacteria cells per ml.; Favorite<sup>18</sup> used suspensions with 800 and 80 millions per ml., and Angle, Algie, Baumgartner, and Lunsford (*loc. cit.*) 600 million per ml. It seems to us that these doses have been taken arbitrarily, without any previous study which would justify them. It appears to us also, that in any studies of allergy in infections, the antigen used should

\* Presented before the Epidemiology Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 13, 1946

be as complete and natural as it is found in the living bacterial cell if we want to have a complete picture and not to miss some of the qualitative and quantitative characteristics of the phenomenon. For these reasons we have engaged in studies of allergy in brucellosis to the whole bacterial cell, as a contribution to the knowledge of this very important problem. Our study undertakes several points that we consider interesting both from the practical and from the purely theoretical points of view. These are:

1. The sensitization and character of allergy of laboratory animals experimentally infected or injected with dead *Brucella abortus* and *melitensis*.

2. The frequency of positive skin reactions to different concentrations of *Brucella* suspensions in supposed normal persons and in proved cases of brucellosis. The results of this part of the study would enable us to fix the proper dose to detect *Brucella* allergy in infected persons

3. The differences of skin reactivity to *Br. melitensis* and *abortus* in cases of brucellosis. The results of this study would enable us to decide whether it is possible to distinguish the species of *Brucella* in a case by means of the allergic skin reaction.

4. The intensity of the allergic skin reaction at different periods after the onset of the disease and its fate after repeated specific stimulus with various intradermal doses of bacterial suspensions, and the influence of these on the course of the disease.

This would enable us to visualize whether it is possible to desensitize against *Brucella* and if this would have any influence on improvement and recovery of the cases.

The purpose of this paper is to describe our studies of the points mentioned, and the results obtained.

#### METHODS

Two antigens were used throughout our experiments. One was a saline suspension of *Br. abortus* and the other a saline suspension of *Br. melitensis*. A stock suspension in saline solution was standardized by turbidity to number 3

of the MacFarland nephelometer, having approximately one billion bacterial cells per ml. and from this ten-fold dilutions in 0.85 per cent NaCl solutions were made. The suspension with 100,000 cells per ml. was labeled dose 1, the suspension with 1,000,000 cells per ml., dose 2; the suspension with 10,000,000 cells per ml., dose 3; and that with 100,000,000 cells, dose 4. The suspensions were prepared with 48 hour cultures of smooth strains of *Br. abortus* No. 3 and *Br. melitensis* No. 2456, except for the repeated specific stimulus in cases of brucellosis, in which the suspensions were prepared with the strains isolated from each case by hemocultures. The *Brucella* were killed with formalin 0.2 per cent.

The skin reactions were made by injecting 0.1 ml. of the antigen intradermally with a 26 gauge needle and tuberculin syringe.

The reaction was read 48 to 72 hours after the injection, and classified as follows:

Edema 5 to 9 mm. in diameter + (one plus)  
Edema 10 to 19 mm. in diameter ++ (two plus)  
Edema 20 to 29 mm. in diameter +++ (three plus)  
Edema 30 mm. or more in diameter ++++ (four plus).

For the study of the frequency of positive skin reactions to different concentration of *Brucella* suspensions in supposed normal persons, and in proved cases of brucellosis, doses 1, 2, and 3 were injected each into different groups of normal persons. In cases of brucellosis, dose 1 was used first; if it was negative, dose 2 was injected; and if this was still negative, dose 3 was used 7 days later.

For the study of the differences of skin reactivity to *Br. melitensis* and *abortus*, both antigens were used. One antigen was injected into the right forearm, and the other into the left forearm of proved cases of brucellosis var.

*melitensis* or at different sites of experimentally sensitized guinea pigs. Dose 2 was used; if the reaction was negative or if no difference was observed between the reaction to both antigens, then dose 3 was injected. The diameter of the erythema and edema of the reaction to both antigens was measured in mm. The average reactions and the percentage giving any difference were calculated for all cases studied.

For the study of the intensity of the allergic skin reaction at different times after the onset of the disease, we skin tested with dose 2 of *Brucella melitensis* several groups of cases of brucellosis which were at different periods of the disease. The size of the edema in the largest diameter in positive reactors was measured and the average for each group calculated.

For the study of the fate of *Brucella* allergy in brucellosis after repeated specific stimulus, we injected into the skin of 35 patients with brucellosis several and repeated doses of the homologous antigen to the species of *Brucella* infecting the case, if this was isolated and identified, or to the antigen giving stronger reaction. We started the injections with the smallest dose giving ++ reaction and when the reaction to the previous injection had disappeared repeated it as many times as necessary for this dose to give a one plus or less reaction; then we continued with the next stronger dose, and so on until the case recovered, or up to 20 injections were given. A numerical value was given to each type of reaction for each dose of antigen; the smallest numerical value (1) was given to the weakest type of reaction (+) to the largest dose of antigen (dose 4); the next numerical value (2) was given to the next stronger type of reaction (++) to the same dose, and so on, until the largest numerical value (16) was given to the strongest reaction (++++) to the smallest dose (dose 1). With these

numbers were calculated the average numerical values for the observed reactions to the doses of antigen injected after a given number of injections were received in each case, as well as the average numerical values of the average values of the reactions observed in all the cases receiving up to the stated number of injections. Then the corresponding type of reaction for the corresponding dose of antigen to this average numerical value was obtained. In this way the average intensity of the observed reactions after receiving up to any number of injections of any dose of antigen was estimated for all the cases studied, thus giving the picture of the fate of the allergy after repeated specific stimulus with various intradermal doses of bacterial suspensions.

The influence of the repeated specific antigenic stimulus on the course of the disease has been only estimated by the improvement in symptoms, the gain in weight and strength, and the more or less rapid recovery of the cases. No controls were observed to estimate whether or not the length of the disease was significantly shortened. Any conclusion in this respect will not be based on statistical analysis but rather on clinical impression.

For the study of sensitization of laboratory animals we infected 4 guinea pigs, 2 with *Br. abortus* and 2 with *Br. melitensis*, by the subcutaneous route and with 0.5 ml. of a 24 hour broth culture. We also injected 4 rabbits with 8 progressive doses of 0.1 to 1 ml. of a *Brucella* suspension with one billion cells per ml. The injections were given at 4 day intervals. Two rabbits were injected with the *Br. abortus* antigen and two with the *Br. melitensis* antigen. Every 15 days after the last injection all rabbits were skin tested each with doses 2, 3, and 4 of *Br. abortus* and *melitensis* antigens. Two female rabbits were passively sensitized by the injec-

tion of 2 ml. of blood serum of one of the rabbits actively sensitized as has been described. Twenty-four hours later they were sacrificed and one of the uterine horns was used for the hypersensitive test following the Dale technique. Tyrode solution was used as the isotonic medium and 0.1 ml. of *Brucella* suspension No. 3 as the inciting allergen.

### RESULTS

*Sensitization of laboratory animals*—Guinea pigs experimentally infected with *Brucella abortus* or *melitensis* gave one month later a negative reaction to the skin test with dose 2 of *Brucella* suspensions, to dose 3 a + reaction, and to dose 4 a ++ reaction. No difference was observed between the reactions to the same doses of *Br. abortus* and *melitensis*.

The rabbits actively sensitized with suspensions of dead *Brucella* reacted negatively to the skin test within 1 month of sensitization, but 1 to 2 months later they gave positive skin

reactions. The type of reactions were: + reaction to dose 2; ++ reaction to dose 3, and +++ reaction with nodule to dose 4. The reactions were always larger for the homologous antigen, the difference being about 2 mm. for each ten mm. diameter of reaction with the heterologous.

The uterus of passively sensitized rabbits reacted to contact with *Brucella* suspensions by contractions that appeared after a period of incubation of 20 to 22 minutes. There was not any apparent difference between the response to the homologous and the heterologous antigen. The reaction was highly specific as shown by control tests.

*Frequency of positive skin reactions in normals and in cases of brucellosis*—The results on the frequency of positive skin reactions to different concentrations of *Brucella* suspensions in 298 supposedly normal persons and in 78 proved cases of brucellosis are given in Table 1. As shown in this table, dose 2 gave the greatest difference between the frequency of positive skin reactions in

TABLE 1  
Frequency of Positive Skin Reactions to Different Concentrations of *Brucella* Suspensions in Supposedly Normal Persons and in Proved Cases of Brucellosis From 3 to 22 Months After Onset

Dose	No. of Cases		% Positive		Average intensity of reaction in positive reactors	
	Normals	Brucellosis	Normals	Brucellosis	Normals	Brucellosis
1 (10,000 orgms.)	31	24	6.4	41.6	+	+
2 (100,000 orgms.)	141	34	8.5	88.8	+	+
3 (1,000,000 orgms.)	126	20	26.1	100.0	++	++

TABLE 2  
Allergy in Brucellosis to *Brucella* Suspensions  
Differences in skin reactivity to *Br. melitensis* and *Br. abortus* in cases of brucellosis var. *melitensis*

	Dose 2 (100,000 orgms.)		Dose 3 (1,000,000 orgms.)	
	<i>Br. melitensis</i>	<i>Br. abortus</i>	<i>Br. melitensis</i>	<i>Br. abortus</i>
Average diameter of erythema mm.	23.8	19.2	30.3	29.5
Average diameter of edema mm.	14.6	10.4	14.7	10.9
% showing larger erythema to				
<i>Br. melitensis</i>		59		48
% showing larger edema to				
<i>Br. melitensis</i>		56.2		70.6
Number of cases studied		16		17

TABLE 3

*Allergy in Brucellosis to Brucella Suspensions*  
*Average skin reaction to Brucella at different periods of the disease*  
*Dose 2 = 100,000 orgsms. x 0.1 ml.*

Period of the disease when first skin tested	Less than 1 month	1 to 3 months	3 to 6 months	6 months to 1 year	1 to 5 years	5 years and over
Number of cases	6	10	10	13	5	4
Number of positives <sup>1</sup>	1	6	9	12	5	4
Average skin infiltration in mm.	1	7	11	15	12	21
Type of reaction	=	+	++	++	++	+++

<sup>1</sup> All negative reactors to dose 2 were positive to dose 3 at the time of this reaction or later.

cases of brucellosis (89 per cent) compared with normal persons (8 per cent). The intensity of the local reactions was about the same with dose 1 and 2 in positive reactors, but was much stronger with dose 3. No general reactions were observed with dose 1, 40 per cent general reactions occurred with dose 2, and 50 per cent with dose 3 in positive skin reactors.

Of the 47 "normal" persons who gave positive skin reactions to any of the *Brucella* suspensions, 20 were studied further to detect actual or past *Brucella* infections. Of these, 6 gave positive agglutination reactions from 1:25 to 1:50; 17 were classified as susceptible, and 3 as immunes according to the Huddleson, Meyer, Gould, and Paulson<sup>19</sup> opsono-phagocytic index.

Most of these supposedly normal persons with a positive skin reaction gave a history suggesting past or present *Brucella* infection.

*Differences in skin reactivity to Br. melitensis and abortus in cases of brucellosis*—The results on the differences in skin reactivity to *Brucella abortus* and *Br. melitensis* in cases of brucellosis var. *melitensis* are tabulated in Table 2. It is shown in this table that more than 70 per cent of the cases gave a stronger reaction to the homologous antigen. With dose 3 the difference in reactivity was shown in a larger percentage. As similar results had been obtained in experimentally sensitized rabbits it is felt that the diagnosis of the species of *Brucella* can be made by the skin test with suspensions

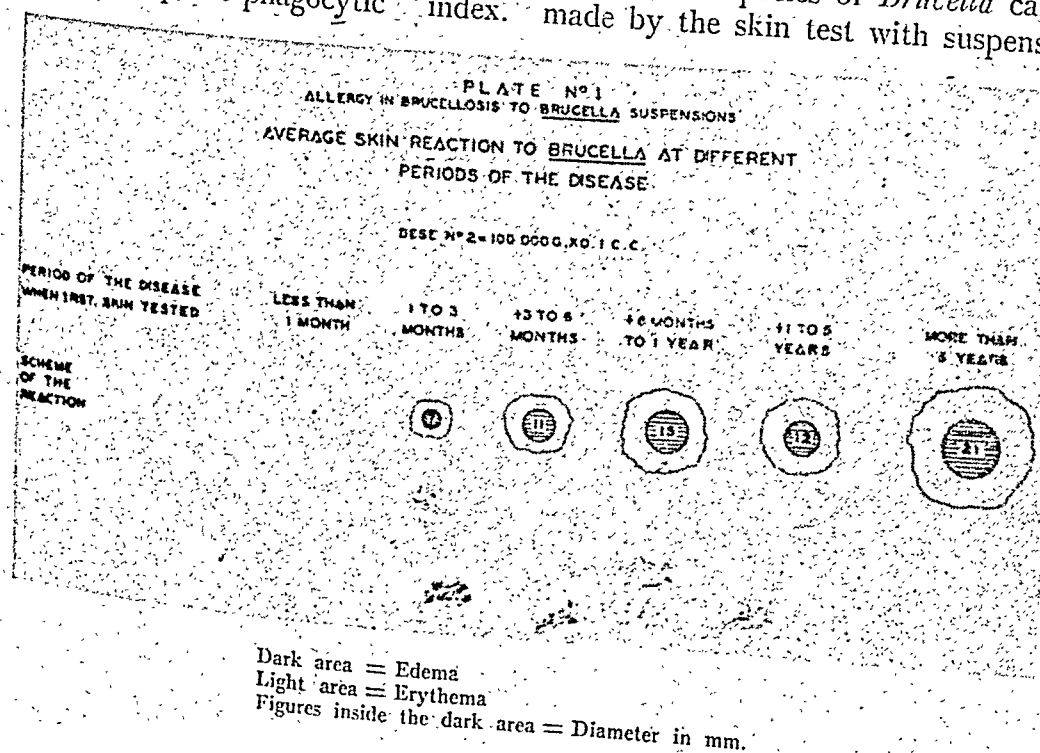


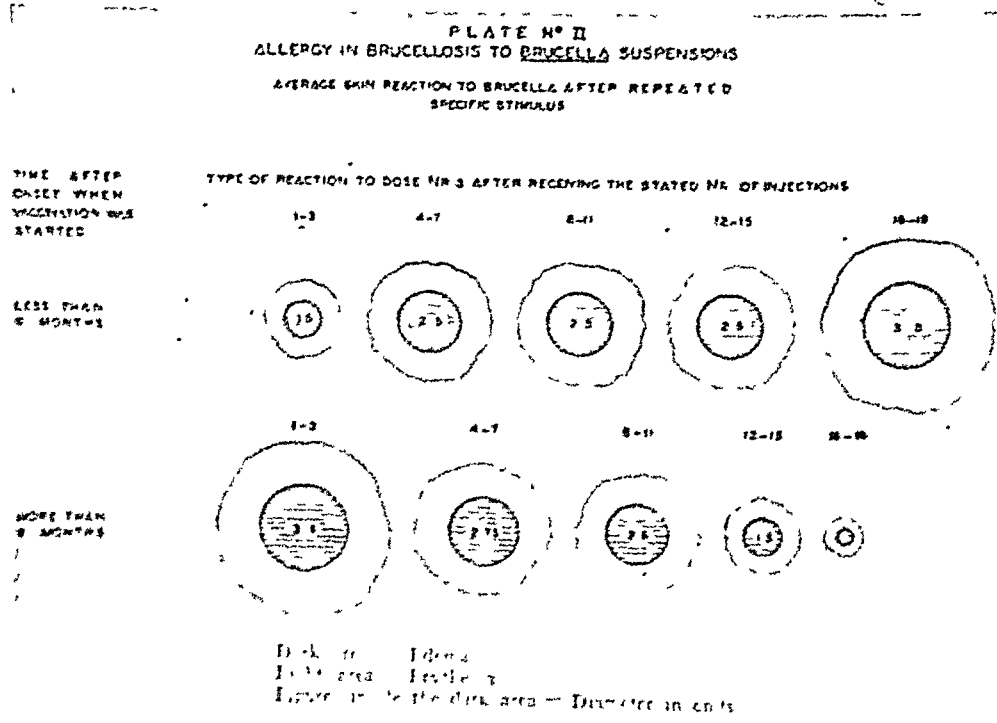
TABLE 4  
Allergy in Brucellosis to Brucella Suspensions  
Average skin reaction to Brucella after repeated specific stimulus

Time after onset when injections started	No. of cases		Average intensity of reactions after receiving the stated number of injections <sup>1</sup>				
			1-3	4-7	8-11	12-18	16-19
Before		Numerical values	5.7	7.1	7.4	7.2	8.2
6 months	20	Int. of R. to D3 <sup>2</sup>	+++	++++	++++	++++	++++
After		Numerical values	8.2	7.5	7.2	5.9	5.2
6 months	15	Int. of R. to D3	++++	++++±	+++	++	+

<sup>1</sup> Injections were given at weekly average intervals.  
<sup>2</sup> Intensity of reaction to dose 3 (1,000,000-organisms).

of *Brucella abortus* and *Br. melitensis*.  
The intensity of the allergic skin reaction at different times after the onset of the disease—The results on this point are tabulated in Table 3, and the scheme of the type of reactions in Plate I. As shown in this table, allergy to *Brucella* suspensions in brucellosis seems to appear after one month has elapsed from the onset of the disease and to increase thereafter with time; as more time elapses the reactions are stronger. We have seen cases 5 to 25 years after the onset of the disease with +++ positive skin reactions to dose 2 of *Brucella* suspensions.  
The late of *Brucella* allergy after repeated specific stimulus—The results

of our studies on this point are tabulated in Table 4 and a scheme is given in Plate II. It is shown in this table that the allergy decreases as the specific stimulus is repeated, arriving to a state, after 16 to 19 injections have been given, in which a one plus reaction is observed with the highest dose of antigen we have used, dose 3. This desensitization only occurs when the specific stimuli are started 6 months or later after the onset of the disease. When these are started within 6 months of onset the allergy increases up to a ++++ average reaction to dose 3 of our antigen in the same period. As the injections of antigen were given at weekly intervals, it can be seen that in



less than 5 months the allergy increased or decreased notably under the influence of the repeated specific stimulus, something that is very different from what occurs normally with allergy in cases of brucellosis, as shown in Table 3 and Plate I.

*The influence of repeated specific stimulus on the course of the disease*—The results of our study on the influence of repeated specific stimulus with various intradermal doses of bacterial suspensions on the course of the disease, are summarized as follows:

Of the 15 patients desensitized with several doses of *Brucella* suspensions, 5 recovered when desensitization was achieved, that is, when 16 to 19 injections were given. Seven recovered before desensitization was reached, when 8 to 18 injections were given, and 3 improved but suspended treatment before complete recovery. The 20 patients in which allergy increased have improved notably; 14 are still under treatment and the others suspended it before recovery. The clinical impression is that cases of brucellosis recover in from 2 to 5 months when they are desensitized under the influence of repeated specific stimulus in this lapse of time, and those which are not desensitized in this same lapse of time improve notably while under repeated specific stimulus, but will take longer to recover as well as to be desensitized.

#### SUMMARY AND CONCLUSIONS

Formalin killed saline solution suspensions of *Br. abortus* and of *Br. melitensis* have been used in the study of allergy in supposedly normal persons and in proved cases of brucellosis in doses of 0.1 ml. of concentrations from 100,000 to 10,000,000 organisms per ml. injected intradermally. *Brucella* allergy in experimentally sensitized guinea pigs and rabbits was also studied. In these laboratory animals positive skin reactions to *Brucella* suspensions were

observed one month or more after previous sensitization; in guinea pigs the reaction was the same to the homologous or the heterologous *Brucella* antigen, while in rabbits the reaction was stronger for the homologous specific antigen. Female rabbits were passively sensitized, and the uterus gave a positive Dale reaction. In supposedly normal persons the skin test was positive to the 10,000 bacteria dose in 6.4 per cent; to the 100,000 bacteria dose in 8.5 per cent, and to the 1,000,000 bacteria dose in 26.1 per cent. In proved cases of brucellosis the reaction was positive in 41.6 per cent with the first dose, in 88.8 per cent with the second dose, and in 100.0 per cent of the cases with the third dose. The skin reaction was stronger to the homologous specific antigen in 71 per cent of the cases with the third dose and in 56 per cent with the second. In the cases studied, the allergy to *Brucella* suspensions appeared after one month had elapsed from the onset of the disease, and increased thereafter until the strongest reactions were observed more than 5 years later. The allergy in cases of brucellosis decreased as specific repeated stimulus progressed, arriving to a state, after 16 to 19 injections were given, in which a very weak reaction was observed to the strongest dose we used. This desensitization occurred only when the specific stimulus was started 6 months or later after the onset of the disease. Patients with brucellosis recovered in from 2 to 5 months when they were desensitized under the influence of repeated specific stimulus by the intradermal injection of *Brucella* suspensions; patients who were not desensitized in this same lapse of time improved notably.

Based on the foregoing results we arrive at the following conclusions:

1. Laboratory animals are actively sensitized either with dead or living *Brucella* suspensions, and passively sensitized with sera of previously sensitized animals.



2. Suspensions of formalin killed *Br. abortus* or *Br. melitensis* seem to be adequate antigens for the detection of allergy in brucellosis. The proper initial dose for this purpose is 0.1 ml. of a suspension with one million bacterial cells per ml. injected intradermally. If the reaction is negative a second injection with a suspension ten times stronger is indicated. A positive reaction is obtained in all or almost all the allergic cases without undue local or general reactions.

3. The diagnosis of the species of *Brucella* between *melitensis* and *abortus* is possible in a large percentage of the cases of brucellosis by the allergic skin test if the two antigens, in the same concentration, are injected at the same time in different sites. The reaction is stronger with the homologous antigen.

4. Allergy to *Brucella* in cases of brucellosis seems to appear one month or more after the onset of the disease and to increase thereafter indefinitely.

5. By repeated specific stimulus with intradermal injections of small and increasing doses of the homologous *Brucella* suspensions, all cases of more than 6 months' duration can be desensitized in from 2 to 5 months. Cases of less duration will take longer.

6. By means of these repeated intradermal injections of increasing doses of the homologous *Brucella* suspensions, all brucellosis patients who become desensitized improve, and most recover within 2 to 5 months of treatment. The ones which are not desensitized in this time will take longer to recover.

#### REFERENCES

1. Fleischer, E. C., and Meyer, K. F. The Bearing of Cutaneous Hypersensitiveness on the Pathogenicity of the *Bacillus abortus bovis*. *Am. J. Dis. Child.*, 16:268, 1918.
2. Burnet, E. Recherches sur la fièvre méditerranée.

III. Diagnostic de la fièvre méditerranée. *Arch. Inst. Pasteur*, 2:187, 1922.

3. Tapia, M., and del Valle, A. Diagnostic Value of the Cutaneous Reaction with Specific Antigen in Malta Fever. *Med. iber.*, 22:317 (Oct. 13), 1928.

4. Leavell, H. R., and Amos, H. L. The Endermic Reaction in Brucella Infections. *Arch. Int. Med.*, 48:1192, 1931.

5. Mitra, M. The Intradermal Reaction in Mediterranean Fever of Infancy. *Pediatrics*, 32:721 (June 15), 1924.

6. Fornaco, L., and Bua-Fazio, F. The Intradermal Reaction for the Diagnosis of Malta Fever. *Riforma med.*, 40:393 (Apr. 28), 1924.

7. de Fermo, C. Method and Value of the Intradermal Reaction in Malta Fever. *Gaz. d. osp. Turin*, 48:859 (Sept. 11), 1927.

8. Giordano, A. S. *Brucella abortus* Infection in Man: The Intradermal Reaction as an Aid in Diagnosis. *J.A.M.A.*, 93:1957 (Dec. 21), 1929.

9. Lancelotti, Rebecca C. The Antigenic Complex of *Streptococcus hemolyticus*: I. Demonstration of a Type-Specific Substance in Extracts of *Streptococcus hemolyticus*. *J. Exper. Med.*, 47:91 (Mar.), 1928.

10. Ando, K. A Simple Method of Obtaining Soluble Specific Substances from Various Bacteria (*Streptococcus viridans*, *B. Dysenteriae*, and *B. Mallei*). *J. Immunol.*, 17:555 (Dec.), 1929.

11. Huddleson, I. F., Johnson, H. W., and Hamann, E. E. A Study of the Opsono-Cytophagic Power of the Blood and Allergic Skin Reaction in Brucella Infection and Immunity in Man. *A.J.P.H.*, 23:917 (Sept.), 1933.

12. Keller, A. E., Pharros, C., and Gaub, W. H. Diagnosis of Undulant Fever. The Opsono-cytophagic, Allergic and Agglutination Reactions. *J.A.M.A.*, 107:1369 (Oct.), 1936.

13. Angle, F. E., Algie, W. H., Baumgartner, L., and Lunsford, W. F. Skin Testing for Brucellosis in School Children. *Ann. Int. Med.*, 12:495, 1938.

14. Memfee, E. E., and Poston, M. A. Significance of Standard Laboratory Procedures in the Diagnosis of Brucellosis. *Am. J. M. Sc.*, 197:646, 1939.

15. Yeckel, H. D., and Chapman, O. D. Brucella Infection in Man. Intradermal Reaction as an Aid in Diagnosis. *J.A.M.A.*, 100:1855 (June), 1933.

16. McBryde, A., Daniel, N. C., and Poston, M. A. Brucella Infection in Children. *J. Pediat.*, 4:401, 1934.

17. Goldstein, J. D. Cutaneous Reaction in the Diagnosis of Undulant Fever. *J. Clin. Investigation*, 13:209, 1934.

18. Favorite, C. O., and Culpe, C. F. The Intradermal Test in Undulant Fever. *J. Lab. & Clin. Med.*, 20:522, 1935.

# American Journal of Public Health

## and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 37

August, 1947

Number 8

### Editorial Board

REGINALD M. ATWATER, M.D.  
*Chairman and Managing Editor*

LEONA BAUMGARTNER, M.D.  
MARTIN FROMISHER, JR., D.Sc.  
PROFESSOR JOHN M. HENDERSON

RALPH S. MUCKENFUSS, M.D.  
STUART MUDD, M.D.  
RAYMOND S. PATTERSON, Ph.D.

C-E A. WINSLOW, D.P.H.

C-E A. WINSLOW, D.P.H., *Editor*

AUGUSTA JAY, *Editorial Associate*

## THE HEALTH OFFICER AND THE HEALTH COUNCIL

THE day of defensiveness in public health has gone by. The health officer has no longer the need to protect his rights and his prerogatives. If he be a trained man, he will find himself recognized without question as the leader of the health program of his area. His problem is an offensive one—the visualization and execution of an ever-widening program for applying our knowledge to the promotion of health in a positive sense.

The health officer should be the chairman of the Board of Strategy for this campaign; but he and his staff cannot wage the war alone. When the health program envisaged only sanitation and the control of epidemic diseases, the official agency could perhaps do the whole job. But today, when the urgent health needs are for housing and nutrition and medical services, for care of chronic diseases, for mental hygiene, for health education, it is clearly impossible to attain major results without a widespread and vital public understanding and support.

We have seen the power of community participation during recent months in the triumph of the health-district plan in Illinois and in the revolution worked under the stimulus of Dr. Florence Sabin in Colorado.

One of the best ways to realize the pulse of progress is to attend a conference of health workers and see what they are thinking about. At a recent meeting of the New England Health Institute in Durham, N. H., the keynote of one speaker after another was the need for wider community participation in the public health program; and it was made clear that "participation" meant just that. Some health officers, who have come only part way out of their shells, consider that what they need is a cheering section, ready to respond with vociferous advocacy of any measure they, as cheerleaders, may indicate. Beyond the ivy walls, human nature does not respond—or only sporadically responds—to such an appeal. Continuous and convinced support implies an understanding of a problem and a sense of sharing in finding the solution.

None of us has all the answers. The man on the spot is inevitably limited by tradition and habit. Rare is the executive who does not sometimes feel—if he does not say—"It's always been done that way here." Nor has the outside expert, called in for counsel, any ready-made solution. If he is an experienced surveyor he talks with everyone, inside and out, who is in a position to evaluate either the

delivery or the receiving end of public health services. From such conferences, in the light of general principles, on the one hand, and local situations and local personalities, on the other, he formulates a tentative program of advancement; and if he sells it to the lay people, something may happen. The ideal result is only attained when the leaders in all the official and voluntary agencies concerned organize themselves for a comprehensive and continuing self-survey.

Such a type of coöperative program planning is the objective of a well conceived Health Council; and that is why we asked Mr. Bleecker Marquette to prepare the Special Review Article for this issue of the *Journal*.

Mr. Marquette points out the results which are manifest in a community where there is no health planning. He shows how a good Health Council should be organized and what it can accomplish. He points out that there are only as yet a score or so of active Health Councils in this country; and that only a few of them are really fulfilling their function well. The Health Council is a relatively new idea; but it is a sound idea and one that is full of promise.

Do you really know how effectively the activities of the health department and the board of education in your community are correlated so as to produce maximum results in the education of the individual child and his family? Is the sanitary inspection service of the health department tied in with the efforts of a local housing authority so that condemnation and compliance orders may fit into a plan, and so that the provision of good housing may keep pace with the elimination of bad housing? Are there adequate community facilities for the rehabilitation of the tuberculosis cases which you send to a sanatorium? Are the services of the various public health nurses of your area coördinated into the most effective practicable pattern? How inadequate are the institutional provisions for the care of chronic illness, and what ought to be done about it? Are the services of venereal disease control supplemented by a decent community recreation program? Is your local safety council putting all its energies into industrial plants and neglecting the much larger problem of home safety? How many hours of child guidance service are available in the community, and how many hours of service at mental hygiene clinics for adults? (The writer knows of two New England cities of the same approximate size where the latter figure is in one case 6 and, in the other, 43.)

These are examples of some of the vital health problems which confront us. They are the problems with which the Biggses and the Chapins of the future will successfully contend. But they cannot solve them singlehanded. Such questions can be answered only by real coöperative effort, by enlightened and continuing program planning. In a good Health Council, under the leadership of a good health officer, lies the hope of the future.

## PLANNING FOR THE CONTROL OF STREAM POLLUTION

A RECENT issue of the *Journal of the New England Water Works Association*, presents an interesting symposium by official representatives of the six New England states on the important problem of stream pollution abatement.<sup>1</sup>

The most fundamental necessity in this field is, of course, the prevention of pollution with intestinal bacteria of lakes and inland waterways which are used as sources of potable water, or by bathers, to an extent which threatens to produce epidemic or occasional case of communicable disease. This basic end has been partially attained in the area in question. It is doubtful if any appreciable

amount of typhoid fever or any other intestinal disease can be attributed to water in the New England States. It is somewhat disconcerting, however, to learn from E. L. Tracy, one of the participants in the symposium we are reviewing, that only 6 per cent of the sewered population of Vermont and less than 3 per cent of the total population of that state, are served by sewage treatment plants.

The problem, however, is much wider than protection against the germs of water-borne disease. Health is an ideal which is not attained merely by escaping typhoid fever. Recreation is an important factor in health as a positive objective, and esthetic satisfaction cannot be omitted from an adequate concept of healthy living. Our lakes and streams are among our most priceless community assets; and to permit them to become open sewers or offensive disposal tanks for factory wastes is a short-sighted policy.

Obviously, the problem is incapable of any simple universal solution. L. W. Trager points out that the conflicting issues are presented with special clearness in New Hampshire. This state has two major assets—its recreational facilities and its industries; and the two interests are directly opposed to each other in their views on stream pollution. In certain streams, the process of pollution has gone so far that the water could only be restored to recreational use at a prohibitive cost which—whether expended by the state or by industry—would ultimately be passed on to the consumer. In such a case, nothing can be done except to keep the resulting nuisance within bearable proportions. In other areas, the value of residential and recreational property is so great that it is clearly to the economic interest of the community as a whole to insist on high standards of purity.

A primary question in any given state, concerns the designation of the proper state authority to make decisions in regard to this problem of local standards for each individual watershed. Among the states included in the New England symposium, responsibility rests with the State Board (or Department) of Health in Massachusetts, Rhode Island; and Vermont. In Connecticut, the task is divided between the State Department of Health (concerned with health aspects of pollution of potable waters, bathing waters, and shellfish-growing areas) and the State Water Commission (concerned with broader phases affecting fish life, use of water for industry, damage to property, and interference with navigation). W. J. Scott of the Health Department, reports close coöperation between the two state agencies; but the maintenance of two boards and two laboratories in such closely related fields does not seem in accord with sound administrative policy. A more logical procedure was in force in earlier years in Connecticut, which centralized technical work in the Health Department and provided an Industrial Wastes Board, including representatives of the Health Department, industry, and the public, to formulate policies. Maine also has a separate State Sanitary Water Board, established in 1941, and New Hampshire has a separate Water Pollution Board, each with its own laboratory. In New Hampshire, the State Water Pollution Commission includes the State Health Officer with representatives of the Governor, the Forestry and Recreation Department, the State Planning and Development Commission, the Fish and Game Department, the Water Resources Board, and representatives from industry and municipalities. The Director of Sanitary Engineering of the State Health Department serves as technical secretary. A plan of this general type seems highly desirable. The basic objective is health in the broad sense; but the problems are too complex to be solved by the Health Department alone, without the voice of spokesmen for the broader social and economic issues which are involved.

Most of these New England States have rightly conceived their first task to be the mapping out of the state so as to define what may be considered a reasonable objective for each individual watershed. In Maine 6,000 miles of inland waters have already been surveyed and classified under the usual four main headings as follows:

Class A—Drinking water sources or waters used for growth of market shellfish

Class B—Waters used for bathing

Class C—Waters used for recreational boating, fishing, seed oyster cultures, or industrial supply after treatment

Class D—Waters used primarily for navigation or transportation of wastes without nuisance

The New Hampshire Board states its objectives in this regard as follows: "To classify streams, lakes and tidal waters (a) according to present highest use (present condition and use), and (b) according to potential highest use, being mindful of the industrial, economic, geographic, and social factors." Its State Water Commission has been materially strengthened by the 1947 Legislature. In Vermont, the Health Department organizes each major river basin (of which there are 12 in the state) by holding a mass meeting, in coöperation with the State Chamber of Commerce, in the largest municipality of the area. At this meeting a river-basin committee or sanitary council is formed with representatives from each individual town; and subsequent meetings are arranged to reach smaller local areas. This seems like an admirable instrument of public health education.

A. D. Weston cites some highly interesting results from the studies made along this line in Massachusetts. One stream, on which there is a large recreational basin, fulfils the standards for Class B on the average (less than 1,000 coliform organisms per 100 ml.), but has at times shown a coliform density of over 100,000 per 100 ml., so that its beaches have had to be closed for bathing. Another stream, generally considered as of high purity, has on some occasions shown over 10,000 coliforms per 100 ml. as a result of unapproved sewers in villages where even the existence of such sewers was not generally known. Mr. Weston claims for his state "one of the most, if not the most highly polluted streams known," with a biochemical oxygen demand once attaining the level of 1,420 p.p.m.

It is most encouraging to see that the basic knowledge of conditions, essential to a rational system of control, is being accumulated so effectively in such states as those which have been cited. Actual progress in bringing desirable standards into effect is still, however, not far-reaching. The state departments of health have ample powers to safeguard waters of Classes A and B by forbidding the use of non-conforming streams or lakes for water supply or bathing or the taking of shellfish and by forbidding bathing or other pollution of established public water supplies. In Connecticut, the state law is so strict as to forbid bathing even in remote tributaries of such supplies, to a degree which unreasonably interferes with normal recreational use. With regard to nuisance problems and—in particular—Class C stream, or an actual Class C stream into a potentially Class B stream, accomplishments have not as yet been notable.

Statutory powers of enforcement are in some instances far-reaching. In New Hampshire, all natural lakes having an area of 20 acres or more ("Great Ponds") "are public waters, and are held in trust by the state for public use; and no corporation or individual shall have or exercise in any such body of water any

rights or privilege not common to all citizens of this state." Under a 1947 Act, all wastes discharged into such ponds must be adequately treated and disinfected.

The State Water Commission of Connecticut is empowered to make orders after hearing, directing any person, firm, or corporation to use or to operate some practicable and reasonably available system or means which will reduce, control, or eliminate pollution, having regards to the rights and interests of all persons concerned, provided the cost of installation, maintenance, and operation shall not be unreasonable or inequitable.

Massachusetts has an even stronger law, providing that the State Department of Health with the approval of the Governor and Council shall "prescribe and establish rules and regulations to prevent pollution or contamination of any or all of the lakes, ponds, streams, tidal waters, and flats within the Commonwealth." Such rules and regulations were formally prescribed and approved in September, 1945. These regulations are far-reaching. They provide that no excremental matters or house wastes, or garbage and manure, and no manufacturing waste or putrescible animal matter shall be discharged into any lake, pond, stream, tidal water, and flat "in a manner which may be injurious to the public health, or may tend to create a public nuisance, except as may be approved by the Department of Public Health when in the opinion of said department the best practicable and reasonably available means to render harmless such refuse, waste product, polluting liquid, substance, putrescible organic matter, or wastes have been provided in accordance with plans approved by the department." This is strong medicine; and, in 1946, four municipalities and several industries were actually brought into court on charges of nonconformance.

In Maine, a law was passed providing that all new industries, established after July 24, 1945, must have a license to discharge industrial wastes into any body of water; but no machinery has been provided for dealing with existing industries.

In Rhode Island the State Health Department has power to compel the elimination of pollution and has done so in certain cases. Mandatory legislation for control of pollution was sought in Vermont in 1943, but "so amended before passage that it practically legalized pollution instead of preventing it." A bill introduced in the 1947 session established a new water conservation board which should produce results. In this state, and in Rhode Island (where a new program has been recently adopted), the authorities are seeking to pave the way for treatment of municipal sewage by laws legalizing service or rental charges to finance bonds for sewage treatment.

All of the New England States except Maine (whose streams flow directly to the sea) have taken steps—or will shortly take steps—to implement interstate action through a New England Interstate Compact Commission.

Connecticut, Massachusetts, New Hampshire and Rhode Island appear to have overall stream pollution laws with potential teeth in them; and in Massachusetts and Rhode Island these laws have been actively enforced in the broader field, beyond the protection of public water supplies. It will be of great interest to observe the Vermont approach by way of a constructive educational program.

#### REFERENCE

1. Symposium by Scott, W. J., Hale, J. E., Trager, L. W., Tracy, E. L., Shea, W. J., and Weston, A. D. *J. New England Water Works Assoc.*, 61:59-87 (Mar.), 1947.

## NURSING EDUCATION IS A PROFESSIONAL PROBLEM

WHENEVER a social situation becomes pressing we may look for the advocates of nostrums and cure-alls, often more deadly than the disease. The present shortage of nurses results from various causes, among which economic factors are of major importance. It is not surprising—though it is unfortunate—that this situation has tempted various committees of eminent surgeons and internists to rush into the breach with the happy idea that the remedy can be found by shortening the nurses training course and returning to the low standards which prevailed a quarter century ago.

This is a familiar phenomenon in many fields. Zealous alumni are frequently quite ready to tell college faculties how their sons should be taught. Writers in some of our leading popular weeklies have recently been pontificating about medical education and demanding that its standards should be lowered—in precise parallel with medical criticism of nursing education. Criticism in itself may serve as a useful stimulus. The unfortunate thing about recent pronouncements of medical committees is their repercussions on the reputation of the medical profession itself. The prestige of the physician must rest on the respect which the public feels for the medical expert; and when the medical expert assumes the right to dictate in a field where he is not an expert, he destroys public confidence in his wisdom in his own area.

Education is a highly technical problem, and the distinguished practitioner of medicine may be—and commonly is—a layman in the educational field. The subject of nursing education happens to have been explored in two exhaustive studies<sup>1,2</sup> in which educators, nurses, hospital administrators, physicians, and public health experts coöperated. The reports of these studies have been universally accepted by all competent authorities. They rightly form the basis for our present program of nursing education. For the practitioner of medicine to ignore them is as ill-judged as it would be for a teacher to brush aside the accepted principles of medical science.

There is, however, one related aspect of the problem of nursing shortage on which the physician can—and should—make an important contribution. The training of the professional nurse is progressing along reasonably sound lines; and it has been found in all educational fields that the way to long-range increase in personnel is to raise rather than to lower standards. There are, however, real possibilities of supplementing the work of the nursing profession by the employment of trained nursing attendants, a subject which we shall discuss in a subsequent issue of this *Journal*. How large the field may be for this type of subsidiary worker—and how that field should be defined—must be carefully studied. This is not a technical problem of education but a problem of administration. It should be analyzed by joint committees of physicians and nurses in the field of private practice, by joint committees of hospital administrators and nurses in the institutional field, and by joint committees of health administrators and nurses in the public health field.

## REFERENCES

1. *Committee for the Study of Nursing Education. Nursing and Nurses Education in the United States.* New York: McGraw-Hill, 1933.
2. *Committee on the Growth of Nursing Schools, National League for Nursing Education. Nurses, Patients and Facilities.* New York, 1935.

## Credit Lines

### FAMILIES CAN'T LIVE IN PAPER HOUSES

The Newark (N. J.) Housing Authority continues to storm the walls of community indifference in behalf of the one-third of that city's population of nearly a half million who live in substandard housing. It starts out by supposing what would happen if a third of the city's people were stricken with tuberculosis, or a third of its houses burning. In the latter instance, it says "when the ashes cooled, money and building materials would be found for the greatest construction job in the city's history . . . Bad housing is . . . no less disastrous than sickness or fire, but it isn't front page news."

If anything can make it front page news such pamphlets as this, entitled "5,580 Paper Houses," can. This number refers to the houses planned since 1944 and awaiting action on the Wagner-Ellender-Taft Housing Bill.

With excellent satirical cartoons and irrefutable logic, this is an excellent attempt at community education. It points out again the high cost of slums and the financial returns of good housing. It also announces the birth of a fifth freedom—freedom to live with in-laws.

### CANCER IN NEW JERSEY ANALYZED

The New Jersey Division of the American Cancer Society (Newark) has recently published *Cancer Mortality in New Jersey, 1920-1945*. This is a statistical analysis for the entire state and county-by-county of the deaths, death rates, age distribution, organ affected, as well as an analysis of the changing age distribution of the general population. Data for the separate counties cover only the 5 years, 1940-1945.

With this analysis available no local cancer program should be delayed because of lack of knowledge of existing conditions.

### ANNALS OF WESTERN MEDICINE AND SURGERY

The Western readers of Credit Lines will be particularly interested in the new *Annals of Western Medicine and Surgery* which began publication in March under the auspices of the Los Angeles County Medical Association. Its editor is Edmund Thorvald Remmen, M.D., Assistant Professor, Department of Internal Medicine, College of Medical Evangelists. With an initial circulation of 7,500, its articles will have general rather than specialized interest, because the majority of its readers are general practitioners.

### WHEN AN EMERGENCY STRIKES

The May *Oklahoma Health Bulletin* tells the story of how, when the recent tornado struck the town of Woodward (population 6,000), the State Health Department was one of the first agencies on the scene, sending sanitary engineers to test the water supply, food and drug inspectors to safeguard food supplies, x-ray and laboratory technicians to aid doctors and nurses and furnish blood plasma, tetanus anti-toxin, penicillin, and typhoid vaccine. In addition doctors and nurses from the State Department of Health were on emergency call.

In this connection it is worth noting that, according to the latest information available to us, neither the town of Woodward nor Woodward County with a total population of more than 16,000 had any organized full-time local health service. Nor in fact did any of the



counties contiguous to Woodward. Thus in a real emergency the state and other agencies had to do the job that should have been the first responsibility of local official agencies.

#### CHILDREN'S BUREAU ANNUAL REPORT

The 34th *Annual Report* of the Children's Bureau for the year ended June 30, 1946, the last year of the Bureau's life in the Department of Labor, was published recently. This summary of a bureau devoted to the special interests of children is well worth reading for its factual information no less than for what it unconsciously reveals about the current world. Included with the report is an 11 point action program for 1947 and 1948 of the National Commission on Children and Youth. Gov't Ptg. Office, Wash., D. C.

#### PUERTO RICO HONORS ITS ELDERS

Patriarchs and matriarchs in Puerto Rico occupied the limelight on April 18 as their countrymen throughout the island commemorated El Dia de los Ancianos—"The Day of the Aged"—with colorful tributes and festivities. El Dia de los Ancianos has been celebrated annually in Puerto Rico since 1933, when it was designated by law as the day on which Puerto Ricans would pay particular tribute to their aged.

#### GROWTH OF BLUE CROSS

The Philadelphia Blue Cross reports that it now has over a million members. March enrollments were nearly 17,000, the largest single month in its 8 year history. In the first quarter of 1947, the 40,000 new members were almost double the same quarter in 1946. Due to rising hospital costs, its rates have been increased by about one-third, but benefits have also been increased.

The annual report of New York's Associated Hospital Service, recently released, shows a membership of nearly

three million. Over half a million were enrolled during 1946, representing a gain of 37 per cent over 1945. During the year more than a quarter of a million persons were hospitalized for an average of nearly 10 days per patient and at an average cost per hospital stay of nearly \$75. In 1947 both payments to hospitals and charges to members are being increased. Additional member benefits are also provided.

The Blue Cross of Philadelphia and the Associated Hospital Service of New York are among 88 similar Blue Cross plans in the United States, with a total membership of nearly 26 million persons, or something less than one-fifth of the nation's population. In presenting the annual report, Louis H. Pink, the President of New York's Blue Cross, declared that in 1946 the ground work had been laid for a more effective national Blue Cross program. "The Blue Cross plans are strong because they are local organizations—but a more effective national organization would be helpful in enlarging membership and arranging for interchange of service, broader benefits, and more effective coöperation with national employers and other health agencies."

#### MICHIGAN'S FIVE YEAR PLAN

To establish a pattern for other states to follow in meeting the requirements of the Hospital Survey and Construction Act, the Commission on Hospital Care made a pilot study in Michigan, recently completed. The W. K. Kellogg Foundation, as a service to the people of the state, has prepared a summary of this survey with maps showing hospital service areas and the various types of hospitals and rural health centers projected by the Hospital Construction Act.

This summary of Michigan's five year hospital plan is a good illustration of a technique for informing and persuading public opinion.

## ARE DOCTORS MOVING TO RURAL AREAS?

The American Medical Association's Bureau of Information in the *J.A.M.A.* for May 17, 1947, senses a "trend of returned medical officers to move away from their recent venture in city practice to accept the opportunities of more active practice in smaller communities." A number of state maps are included to show the difference between 1946 and 1947 in the ratio of patients to practising physicians in these states. This trend will be worth watching to see whether it continues to offer a rosier outlook for medical care in rural areas.

## FAREWELL TO THE SOCIAL SECURITY BOARD

The Social Security Board sings its swan song in its 11th Annual report for the fiscal year 1946. In some 100 pages it summarizes the administrative changes arising out of the President's Federal Reorganization Plan which went into effect in July, 1946, and which transferred the Board's functions to the Federal Security Administrator. Apart from the analysis of current activities, this report is valuable for its summary and recommendations based upon 11 years of experience. The report includes also a section on prepayment of medical care costs. Available from U. S. Gov. Ptg. Office, Washington 25, D. C. 25 cents.

## MORE ABOUT TRAINING OF RURAL DOCTORS

In February (p. 214) we reported that Mississippi currently has a scholarship loan program for training 47 of its own citizens to become doctors and practise in rural areas of the state. Now the Mississippi State Medical Education Board has published a pamphlet, *Doctors To Come*, which tells more about this program and illustrates the story with pictures, pictographs, and illustrative charts. This ought to help those Mississippi men and women in whose

hearts burns the torch of desire to serve their fellowmen and to help those who suffer," to choose a career.

At present 60 doctors are being trained, 2 of whom will be ready to practise in 1948, 9 in 1949, and all of them by 1952 or earlier. Unfortunately only 7 are Negroes in a state whose Negro population is almost half of the total. The 60 are being trained in 11 medical schools in 7 states and the District of Columbia.

The pamphlet also has some fertile ideas for other states contemplating similar programs. Applicants and others interested should address: Mrs. Maria Voskamp, Executive Secretary, Mississippi State Medical Education Board, Room 37, North St. Building, Jackson 35, Miss.

Kentucky has also taken note of the fact that for its rural population of more than two million it has only one practising doctor for more than 2,100 persons. The Kentucky State Medical Association and the University of Louisville School of Medicine have launched a joint state-wide campaign for a Medical Scholarship Fund of \$100,000. This fund will be used for loans to students who could not otherwise afford a medical education. Students must agree to practise one year in a rural area for each year of financial aid received.

Contributions in any amount are received at Medical Scholarship Fund, 620 So. Third Street, Louisville 2, Ky.

## ABSTRACTING THE WORLD'S MEDICAL LITERATURE

*Excerpta Medica* of Amsterdam, Holland, has undertaken a project of abstracting the world's literature in the fields of research and clinical medicine. Fifteen separate subjects, among them Public Health, Social, and Industrial Medicine, will each be covered by a monthly journal published in English. The editorial board of each journal is comprised of authorities from many

countries, including liberal representation from the United States. The series will replace the old German Zentralblätter and Berichte series which will not be revived.

Vol. I No. 1 of Section XIII, on Dermatology and Venereology, April, 1947, has been received by Credit Lines. It abstracts 289 articles under 25 different subheadings of the main subject. Its board of 25 editors represents 12 European countries and the United States.

The yearly volumes for the various sections will range from 600 to 1,800 pages, and the annual subscriptions from \$15 to \$45. Section IV on Public Health, Social and Industrial Medicine will aggregate 900 pages annually and has a subscription price of \$22.50. Williams & Wilkins Company, Baltimore 2, Md., are sole agents for the United States, Canada, and Central America. A free booklet describing the series is available from the agents on request.

#### MAYORS TAKE A STAND ON HOUSING

The United States Conference of Mayors has published *America Can Not Afford Slums*. This is a graphically illustrated pamphlet emphasizing what has come to be increasingly recognized, that slums are a far greater drain on a community's resources by way of the costs of ill health, police and fire protection, unpaid taxes, and many other liabilities, than the public subsidies necessary to provide decent housing for the lowest income groups. This is over and above the fact that a slumless city is much more attractive than one with slums. This is good material for educating your city fathers, particularly if they are penny-wise and pound foolish. You will like it also for its excellent printing, typography, and photography. Published by the United States Con-

ference of Mayors, Washington, D. C.

#### WORTH ACQUIRING

*What You Can Do About Tuberculosis*—This manages to be new and interesting even though it must of necessity tell the old, old story of preventing tuberculosis. In blue and white and with humorous little mannikin line drawings, it might capture the interest of someone who had hitherto turned a deaf ear. Available from Life Conservation Service, John Hancock Mutual Life Insurance Company, Boston 17, Mass. Also worth while is a one page list of health publications still in print and available, in limited quantities, from the Company.

*Rabies: A Challenge to the Community*—Using pastel shade illustrations that have almost come to be the Lederle trade mark, this is intended for the use of the health officer and veterinarian in organizing community programs for rabies control. Because rabies strikes only rarely, says the announcement, community indifference is the rule and can be corrected only by adult education. Copies may be secured from Rutledge W. Howard, Director of Professional Service, Lederle Laboratories, 30 Rockefeller Plaza, New York 30, N. Y.

*The Hospital Act and Your Community*—Local responsibility is the keynote of this pamphlet by the Division of Hospital Facilities, U. S. Public Health Service explaining the Hospital Construction Act and how it works. In simple language and excellent cartoons it brings home the message that "community freedom and community responsibility go hand in hand." It is an excellent illustration of "bureaucrats" stepping down in favor of the citizenry, as well as of health education of a high order. Available from U. S. Public Health Service, Washington 25, D. C.

## BOOKS AND REPORTS

All reviews are prepared on invitation. Unsolicited reviews cannot be accepted.  
All books reviewed in these columns may be purchased through the Book Service.

Henrici's *Molds, Yeasts and Actinomycetes*—Revised by Charles E. Skinner, Ph.D., Chester W. Emmons, Ph.D., and Henry M. Tsuchiya, Ph.D. (2nd ed.). New York: Wiley, 1947. 409 pp. Price, \$5.00.

In the 17 years that have elapsed since the first edition of this book an enormous amount of work has been done, and a great deal of new information has been brought to light in the field of mycology, so that it is now a major subject in its own right. Consequently, on the basis of a rather concise monograph on molds, yeasts, and actinomycetes written primarily for bacteriologists, the revisers of Henrici's work have been able to build an excellent textbook of 409 pages. The size and form of the book are little changed.

The emphasis of the first edition was on mycology for bacteriologists, and this has been admirably maintained by the writers of the 2nd edition. Technical advances are described from a functional point of view and are incorporated in a much enlarged chapter III. The medical aspects of mycology have been enlarged because knowledge in that field has enlarged. On the other hand, industrial and other aspects have also been much expanded so that the treatment of the whole subject is well balanced.

In general, the 2nd edition presents more on the activities of yeasts, molds, etc., than did the first. The sexual phenomena of yeasts and molds have been more fully described, and new developments in the field of hybridization are discussed. New classifications are given (one adapted from Stelling-

Dekker replaces the old one for *Endomycetaceae*) and, in general, the whole book has been enlarged and changed where new developments have necessitated it, and large sections of obsolete material have been deleted. There is an extensive new chapter on variations; the chapters on fungus diseases are entirely revamped and enlarged; there are new chapters on biological activities, morphology and classification of yeasts and molds; new material on fermentations, spoilage and antibiotics; and much else of interest and value.

One appreciates the sympathetic attitude of the authors who, in suggesting certain mycological reference books for bacteriologists, warn that some are difficult. This bacteriologist finds such attitude throughout the book one of its most valuable features as it keeps the treatment on a fundamental and generalized level most helpful to those of us who are not, like the authors, experts in mycology. — MARTIN FROBISHER

*Medical Education and the Changing Order*—By Raymond B. Allen, New York: The Commonwealth Fund, 1946. 142 pp. Price, \$1.50.

Dr. Allen's monograph of the New York Academy of Medicine series on current trends in medical education, has the twin virtues of conciseness and easy readability. He brings to the subject the unusually broad academic background of a doctor of philosophy as well as a doctor of medicine, to which was added the graduate training of a surgical specialist. His years at Columbia, the New York Post Graduate, Wayne

University, and at the University of Illinois, have given him the experience to describe with authority and assurance the problems faced by the medical student, teacher, practising physician, and the patient. For both the health counsellor and patient, medical education is demonstrated to be a life-long process for which they have a joint responsibility.

While the emphasis in this volume is on today's widening horizons of opportunity presented to medical educators and physicians in the current changing social order, Dr. Allen supports his thesis with an illuminating historical account of how we have reached our present stage of development. In a society in the process of continuous dynamic change, the obvious task of education and of forms of health service is not only to adapt to meet new conditions, but to attempt to visualize them in advance. Dr. Allen points out that the organized profession has shown vigorous concern for the maintenance of high medical standards, but has failed "to exhibit sufficient social insight and aggressive leadership in moulding public opinion" in working out a more comprehensive plan for rendering medical care to the whole population.

If doctors are to be trained to provide such leadership, better educational foundations must be laid if the physicians of tomorrow are to be oriented to the full range of their anticipated fields of usefulness. The process must begin in the home and in primary school, for it has been amply demonstrated that most medical students made their decision as to career before entering high school. The function of the undergraduate college years is largely that of guidance.

Since the newer concept of medical study is to consider it to embrace the physical, psychological, and social factors bearing on health and disease, a

very much broader educational base must be constructed on which to build all through the school years and extending into the internship and residency. Dr. Allen develops very clearly the newer requirements of these years of formal study. Also, he brings out the burning and unsolved problem involved in the discovery and encouragement of good teachers of medicine. Actually, this issue has become even more acute in the short time since the publication of this monograph. Unwise policies during the war and lack of adequate economic reward are resulting in a serious scarcity of young medical men and women for teaching and research careers.

Dr. Allen's little book should provide informative and interesting reading material for nursing, social service, and other allied medical groups. If the team work job which the public expects of us is to be accomplished, it is essential that all workers are informed as to what each member of the team is doing.

J. A. CURRAN

*Penicillin in Syphilis—By J. E. Moore, M.D. Springfield: Thomas, 1947. 319 pp. Price. \$5.00.*

The book under report is well written and displays the clear and forceful style of the author. In the coverage of subject material it appears to be as complete as is to be expected from the state of knowledge prevailing at the time of writing. In common with all volumes devoted to a medical subject in the early stages of its development, the work risks becoming obsolete at any early date due to the rapid accumulation of data resulting from more exhaustive studies and more prolonged experience.

Many of the charts display the results produced by 300,000, 600,000, and 1,200,000 units of penicillin given over the period of one week. The schedules involving these amounts have been largely abandoned and the findings

should not be confused with the character of results which apparently may be produced by a more generous use of the antibiotic. Also, the superior value of therapies employing penicillin and arsenic as compared to penicillin alone is not being confirmed by recent analyses.

The author is wisely conservative in the matter of the value of penicillin therapy in cardiovascular and neurosyphilis because of the prolonged post-treatment observation periods which are required for an evaluation, and in the matter of differentiating reinfection and relapse, another phase of the work which cannot be resolved on the basis of presently available knowledge.

The "cumulative failure rate" is a statistical procedure which may be induced to reveal different values through the expedient of varying the time intervals which are involved in the computation. In the opinion of the reviewer, the "cumulative re-treatment rate" would seem to be more appropriate as the rate includes patients re-treated for all reasons.

JOHN F. MAHONEY

**Practical Nursing—An Analysis of the Practical Nurse Occupation with Suggestions for the Organization of Training Programs.** Washington: Federal Security Agency, U. S. Office of Education, 1947. 144 pp. Price, \$.55.

This *Bulletin* is notable in that it is the first effort ever made to analyze the occupation of practical nursing, and timely in that it appears at a time when the acute nursing shortage is focusing attention on the preparation and use of the practical nurse.

It gives a clear and comprehensive definition of the field as distinguished from that of professional nursing, an analysis in table form, covering 119 pages, of what the practical nurse must be able to do, what she must use and what she must know, as well as concrete suggestions for training programs.

It should prove useful to communities that are planning new schools and also to already existing schools as a criterion for evaluating their programs.

The names of the persons who were on the working committee which produced the *Bulletin* and the well known organizations which they represent lend authority to this publication.

ETTA A. CREECH

**Standard Methods for the Examination of Water and Sewage—By American Public Health Association and American Water Works Association. (9th ed.) New York: American Public Health Association, 1946. 286 pp. Price, \$4.00.**

The material in the ninth edition of this standard laboratory manual for the physical, chemical, and biological analyses of water and sewage is placed in a more convenient form than any previous edition. The number of major parts have been reduced to four, related analyses are rationally grouped, confusing Roman numerals have been eliminated, and references to previous or subsequent procedures are paginated. These improvements will promote speed in use.

The principle changes are in the tests of water for odor, hardness, pH, carbon dioxide, alkalinity, arsenic, iron, chromium, magnesium, potassium, fluorides, phosphates, cyanide, tannin and lignin, residual chlorine, hydrogen sulfide, and methane. In the main the new procedures require greater analytical skill, and often call for reagents that the average laboratory will not have readily at hand. For making colorimetric determinations of iron, potassium, silica, copper, aluminum, chromium and magnesium, use of an optical or photoelectric colorimeter, or a spectrophotometer is recommended. For pH determinations, a pH electrometer is recommended. Although alternative methods will continue in use, the wider

use of instrumental methods in water analysis may be expected. A helpful feature is a brief statement of the chemical basis of the test given before each analytical procedure for water. The section on residual chlorine tests is outstandingly excellent.

There are modifications and additions to procedures on dissolved oxygen and grease and sludge tests. The use of tryptone glucose extract agar for bacterial plate counts is permitted, and lauryl sulfate tryptose broth is listed. The bacteriological control of swimming and bathing water is included among the standard methods for bacteriological examination of water, removing that topic from its provisional status in the eighth edition. EMIL T. CHANLETT

**Sewerage and Sewage Treatment**  
—By *Harold E. Babbitt*. (6th ed.).  
New York: Wiley, 1947. 692 pp.  
Price, \$6.50.

The last edition of this textbook was published in 1940. During the war municipal sewerage works and treatment plants construction practically stopped, but many military installations were built. Information obtained from military establishments has been included. In comparison with former editions, the book stresses more the problems of design, methods of treatment, and operation of plants than construction. Data in the book have been brought up to date, the discussion of the rational method of determining runoff has been revised, a chapter on hydraulics has been improved, high rate filters, contact aerators and other newer developments have been added.

Practically all problems given in the appendix have been changed and many new problems have been added. Of particular interest is the extensive increase in references to current literature, numbering some 527, which increases the value of the textbook materially for advanced students and those

in the field who need more detailed information than a textbook ordinarily can supply. The book is printed in clear type on good paper.

WILLEM RUDOLFS

**Health and Fitness**—By *Florence L. Meredith*. Boston: Heath, 1947. 325 pp. Price, \$2.20.

Concentrating on the essentials for those students who wish to be able to do the things that bring pleasure, usefulness, and social acceptance, the author relates good health practices with knowledge presented through modern text, impressive illustrations, and timely examples. The numerous and varied study guides will help good teachers who naturally create heavy workloads for themselves. The vocabulary is appropriate for literate students who are at ease with clear expression.

This text will be most useful in imaginative educational systems. The memorizing of definitions, lists of characteristics and enumerated functions cannot be the basis for evaluations in a course using it. Its presentation is consistent with the author's assumption that the student is seeking knowledge about himself as a means of achieving satisfactions resulting from good health. The teacher, then, must evaluate student comprehension through discussion and ability to deal with problems, preferably actual health problems in clinical practice, laboratory demonstrations, and community public health programs. Consequently, the assumption of student literacy, ability, and interest must be matched by imagination, information, and initiative on the part of the teacher.

Having provided a wide variety of subject matter, the author places on the student much of the responsibility for profiting from this text. A non-medical reviewer of this book was impressed by the wealth of useful scientific information of interest to high school students.

The book evidences professional com-

petence readily appreciated by good students. It also provides an opportunity for exposure to the influence of a good mind. Alert students with professional possibilities and vocational ambitions will respond to it. Quite complete subject coverage is achieved through the variety of activities, age levels, and types of persons described. Students will find themselves personally involved in most chapters.

JOHN KHANLIAN

**Old People—Report of a Survey Committee on the Problems of Aging and the Care of Old People—**  
*Chairman, B. Seeborn Rowntree. New York: Oxford University Press, 1947. 202 pp. Price, \$1.50.*

This report gives the present status of social action in regard to the "care and the comfort of the aged poor" in the surveyed areas, and contains recommendations directed particularly to authorities of public and voluntary agencies.

The National Insurance Act of 1946 and the "projected" National Health Service give England stronger social legislation than we have. When the first of these two Acts comes into full operation, admission to an institution will not be a disqualification for drawing a retirement pension. Two viewpoints regarding the care of the aged, chronically ill are given.

The committee consider that the statutory inspection of all voluntary homes is desirable, but they have been unable to find a definition of a "voluntary home" that would make inspection administratively possible.

Certain concrete recommendations regarding the nature of research projects are made.

By and large, the aged in England

present and have the same problems as do our old people.

This report will be of interest to all persons who are concerned with the comfort and welfare of aged individuals. With only a few changes, this committee report would be applicable to the most populous communities in this country.

JOSEPH H. KINNAMAN

**The Relation of Diseases in the Lower Animals to Human Welfare**  
*—By William A. Hagan, et al. New York: New York Academy of Sciences, 1947. pp. 351-576.*

This series of papers was presented at a conference held by the Section of Biology of the New York Academy of Sciences in March, 1946. Contents include papers on Rabies by Harald N. Johnson; Equine Encephalomyelitis by Raymond A. Kelser; Psittacosis, Ornithosis, and Related Viruses by Herold R. Cox; Brucellosis by I. Forest Huddleson; The Prevention of Plague by Karl F. Meyer; Animal Tuberculosis by William H. Feldman; Anthrax by C. D. Stein; *Erysipelothrix rhusiopathiae* Infection in Swine and in Human Beings by Joseph V. Klauder; and Animal Parasites Transmissible to Man by Willard H. Wright.

Besides the scientific contributions there is a tabulation of estimated cost of various livestock diseases in a recent year which is said to exceed \$400,000,000 in the United States, with the probability that it approaches a billion dollars. Emphasis is placed on freedom in the United States from such diseases as rinderpest, foot and mouth disease, fowl pest, bovine piroplasmiasis and contagious pleuropneumonia. This is a reference volume of importance which should be available in all libraries.

REGINALD M. ATWATER



## A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

**Ten Experts Say**—German measles and mumps provide the strongest argument in favor of childhood exposure to certain communicable diseases. Rather than attempt to prevent the spread, physicians should encourage exposure of healthy children to chickenpox, measles, and the two infections mentioned above, this group of pediatricians advise. This does not apply to sick or debilitated children, of course, or those under 3 years old. Triple vaccines are discussed pro and con.

ANON. Pediatrics. New England J. Med. 236, 23-867 (June 5), 1947.

**Health Problem in 26 States**—If there is any reader of our *Journal* who does not know the essential story of rabies in man and animals he will find all he needs in this brief review article.

CHANT, H. L. Rabies. Am. J. Nurs. 47, 6 390 (June), 1947

**Bearing Babies without Pain**—You've heard no doubt about the English doctor who talks his maternity patients into wanting "natural" childbirth without benefit of drugs. Well, here his method is described, inch-by-inch.

COTTEN, H. Childbirth Without Fear. Am J Nurs. 47, 6-392 (June), 1947

**Fourth Year of High Incidence**—Not only does this paper tell where, in the U.S.A. the 25,000 polio cases of the 1946 epidemic were located, but it relates the conditions in other parts of the western hemisphere. Briefly it considers methods of spread. Recent epidemiologic data strengthen, rather than weaken, the person-to-person contact theory, says the author.

DAVIS, C. C. Incidence of Poliomyelitis in

1946. Pub. Health Rep. 62, 25:901 (June 20), 1947.

**Darkening Forecasts**—You may think a paper on the threatening "recession" is not public health literature, but I do. If the storm hits us, it will affect public health generally and your little job too. You'll find a lot to mull over in this well documented whither-are-we-drifting analysis.

GILLMOR, D. S. Are We in for a Depression? Survey Graphic. 36, 6:325 (June), 1947.

**From Human Volunteers**—We've learned that infectious hepatitis is a virus disease spread through the intestinal-oral route and can be prevented by passive immunization. Evidence is presented that it may run its course without the appearance of clinical jaundice. If you are satisfied with these few dry bones picked from the findings, then you aren't much interested in this relatively new addition to our growing list of public enemies.

HAVINS, W. P. The Etiology of Infectious Hepatitis (and) MALLORY, T. B. The Pathology of Epidemic Hepatitis. J.A.M.A. 134, 8 653 (June 21), 1947.

**Structure of the Endospore**—Although you may have the merest smattering of bacteriology you'll be thrilled with these electron microphotographs of bacteria popping out of germinating spores and a picture of a bacillus with what looks like warts.

KNAYSE, G., et al. A Study, with High-Voltage Electron Microscope, of the Endospore and Life Cycle of *Bacillus Mycoides*. J. Bact. 53, 5:525 (May), 1947.

**Teamwork Does It**—Now that the tumult and shouting have died away,

you may read in peace the last words in the care of poliomyelitis patients from the medical, psychological, and nursing angles.

LOWMAN, C. LER, *et al.* Poliomyelitis. *Am J Nurs* 47, 6:367 (June), 1947.

**Inconclusive**—DDT was applied to 4-square-mile areas in 2 cities threatened by poliomyelitis. A temporary reduction of flies was achieved. Though the demonstrations taught us a lot about the difficulties and costs of wholesale fly abatement, they did not offer evidence of its value in the control of polio.

MELNICK, J. L. Fly-Abatement Studies in Urban Poliomyelitis Epidemics During 1945. *Pub Health Rep.* 62, 25:910 (June 20), 1947.

**Price of Neglect**—When virulent smallpox hit an unprepared city, the mass vaccination program almost overwhelmed the medical and health fraternity.

PALMQUIST, E. E. The 1946 Smallpox Experience in Seattle. *Canad. Pub. Health J.* 38, 5:213 (May), 1947.

**As the World Shrinks**—Now epidemic in war-stricken areas, tuberculosis seems on the way out in lucky U.S.A. But until every country is free, no country can be entirely safe—to paraphrase a potent slogan.

PARRAN, T. The Control of Tuberculosis in the Americas. *Pub. Health Rep* 62, 23:827 (June 6), 1947.

**Changing Food Habits**—When women make up their own minds to adopt desirable nutritional practices, they are much more likely to improve food habits permanently than if they were merely

influenced by lectures. Both in increasing family consumption of milk and in securing coöperation in infant feeding, the group decision method proved superior.

RADKE, M., and KLISURICH, D. Experiments in Changing Food Habits. *J. Am. Dietet. A.* 23, 5:403 (May), 1947.

**The Last of the Louse**—Here are all the details—with how-to-do-it photographs—of the now famous Naples typhus fever epidemic which mass delousing nipped at the start.

SOPER, F. L., *et al.* Typhus Fever in Italy 1943-1945 and Its Control with Louse Powder. *Am. J. Hyg.* 45, 3:305 (May), 1947.

**Now at the 102nd Meridian**—Field surveys, covering half the country, record the eastward creep of plague via rodents and their fleas. The possibilities of introduction into more remote municipal areas by migrations or through commerce deserve continuous and expectant attention, says this student of the problem.

WAYSON, N. E. Plague—Field Surveys in Western United States During Ten Years (1936-1945). *Pub Health Rep* 62, 22:780 (May 30), 1947.

**Histoplasma Capsulatum**—Has the word histoplasminosis crept into your vocabulary while you still have only fuzzy ideas about the public health implications of this novelty? Then you had better master this paper, though it is mostly medical speculation. Coccidioidomycosis adds to the confusion.

ZWERLING, H. B., and PALMER, C. E. Pulmonary Calcification in Relation to Sensitivity to Histoplasmin. *JAMA.* 134, 8:691 (June 21), 1947.

## BOOKS RECEIVED

*Listing in this column acknowledges the receipt of books and our appreciation to the senders. Space and the interests of readers will permit review of some, but not all, of the books listed.*

- THE AMERICAN YEAR BOOK—1947. Edited by William M. Schuyler. New York: Thomas Nelson, 1947. 1110 pp. Price, \$12.00.
- AN APPROACH TO SOCIAL MEDICINE. By John D. Kershaw, M.D., Baltimore: Williams & Wilkins, 1946. 329 pp. Price, \$4.50.
- ATLAS OF CARDIOVASCULAR DISEASES. By Irving J. Treiger, M.D., St. Louis: Mosby, 1947. 180 pp. 244 ill. Price, \$10.00.
- BABIES KEEP COMING (An Anthology). Edited by Becky Reyher. New York: McGraw-Hill, 1947. 538 pp. Price, \$3.75.
- CLEVELAND MARKET DATA HANDBOOK. By Howard Whipple Green. Cleveland: Real Property Inventory of Metropolitan Cleveland, 1947. 77 pp. Price, \$2.50.
- THE CO-OPERATIVE PROCESS AMONG NATIONAL SOCIAL AGENCIES. By Ray Johns. New York: Association Press. 290 pp. Price, \$3.00.
- HEALTH AND REHABILITATION THROUGH CHEST TRAINING. By Samuel Delano, M.D. New York: William-Frederick Press. 142 pp. Price, \$2.50.
- A HISTORY OF THE AMERICAN MEDICAL ASSOCIATION 1847-1947. By Morris Fishbein, M.D. Philadelphia: Saunders, 1947. 1226 pp. Price, \$10.00.
- HUMAN BEELDING AND SURVIVAL. By Guy Irving Burch and Elmer Pendell, Ph.D. (rev. ed.) New York: Penguin Books, 1947. 144 pp. Price, \$25.
- MADRIAGES ARE NOT MADE IN HEAVEN. By Janet Fowler Nelson, Ph.D., in collaboration with Margaret Hiller. New York: Woman's Press, 1947. 156 pp. Price, \$1.75.
- MEDICAL APPENDIX. Studies of the New York Academy of Medicine Committee on Medicine and the Changing Order. New York: The Commonwealth Fund, 1947. 156 pp. Price, \$1.75.
- METHODS OF DIVING II. By Logan Clendenen, M.D., and Edward H. Heshinger, M.D. St. Louis: Mosby, 1947. 468 pp. 143 ill. Price, \$12.00.
- MURDER BY ANATOMY AND ANATOMICAL SURGERY. By Selma A. Wakeman. (rev. ed.) New York: The Commonwealth Fund, 1947. 415 pp. Price, \$4.00.
- OCCUPATIONAL DISEASES OF THE SKIN. By Louis Schwartz, M.D., Louis Tulipan, M.D., and Samuel M. Peck, M.D. (2nd ed. rev.) Philadelphia: Lea & Febiger, 1947. 964 pp. 146 ill. Price, \$12.50.
- THE PAPWORTH FAMILIES. By E. M. Brieger. New York: Grune & Stratton, 1946. 674 pp. Price, \$12.00.
- PROCEEDINGS OF THE 38TH, 39TH AND 40TH ANNUAL MEETINGS OF LIFE INSURANCE ASSOCIATION OF AMERICA. New York: Life Insurance Association of America, 1946. 182 pp. Free from publisher.
- A PSYCHOLOGY OF GROWTH. By Bert I. Beverly, M.D. New York: McGraw-Hill, 1947. 235 pp. Price, \$2.50.
- ROCKY MOUNTAIN CONFERENCE ON INFANTILE PARALYSIS. Sponsored by The University of Colorado and The National Foundation for Infantile Paralysis. Denver: University of Colorado, School of Medicine and Hospitals, 1946. 199 pp.
- SCHOOL HEALTH PROBLEMS. By Laurence B. Chenoweth, M.D., and Theodore K. Selkirk, M.D. (3rd ed.) With an Outline on School Health Administration. By Richard Arthur Bolt, M.D., Dr.P.H. New York: F. S. Crofts & Co., 1947. 419 pp. Price, \$3.00.
- SOCIAL ASPECTS OF PUBLIC HOUSING. An Evaluation of North Carolina Experience. By Sanford Winston. Housing Authority of the City of Raleigh, N. C., 1947. 44 pp.
- STATISTICAL ABSTRACT OF THE UNITED STATES, 1946. (67th number). Compiled under the supervision of Morris H. Hansen, U. S. Department of Commerce, Bureau of the Census. Washington, D. C.: U. S. Government Printing Office, 1946. 1039 pp. Price, \$2.25.
- TEXTBOOK OF MICROBIOLOGY. By Kenneth L. Burdon, Ph.D. (3rd ed. rev.) New York: Macmillan, 1947. 728 pp. Price, \$3.50.
- TUBERCULOSIS NURSING. By Grace M. Longhurst, R.N. (2nd ed.) Philadelphia: Davis, 1947. 358 pp. Price, \$3.50.

## ASSOCIATION NEWS

### A.P.H.A. PRESENTS TESTIMONY ON NATIONAL HEALTH ACT OF 1947

On June 27, Reginald M. Atwater, M.D., Executive Secretary of the American Public Health Association, appeared as a representative of the Executive Board of the Association before the Subcommittee on Health of the Senate Committee on Labor and Public Welfare in the U. S. Senate, Washington, D. C., to present testimony as approved by the Executive Board on Senate Bill 545, the National Health Act of 1947.

A brief digest of the testimony is appended. Readers of the *American Journal of Public Health* desiring the full testimony can obtain a copy by request from the Association, 1790 Broadway, New York 19, N. Y.

The public health professions are deeply concerned with Senate Bill 545 which relates to the medical care available to the American people and which is also intimately concerned with the organization of the health services of the federal government. It was pointed out that the official statement of the Association policy, "Medical Care in a National Health Program," adopted at the 1944 Annual Meeting, recognizes that a large portion of the population receives insufficient and inadequate medical care, chiefly because persons are unable to pay the cost of services on an individual payment basis when they are needed, or because the services are not available.

The testimony documents present inadequacies of medical care and points out that many Americans find it difficult to carry the rise in costs. It was concluded that a majority of the population does not receive adequate medical

care and that these costs are decidedly uneven and unpredictable.

In the opinion of the Association, Senate Bill 545 does not meet the Association's criterion of a national program for medical care, being designed primarily to provide federal aid to the states for the medical and dental care of the needy. It is implicit in the Bill that there must be application of a means test to determine those whose incomes are sufficiently low to be eligible. In actual practice it is believed that only recipients of public assistance and those who are one step removed from this state could receive benefits under this Bill. It was further pointed out that the size of the federal appropriation is such as to represent the cost of care for only about 5 per cent of the population, to say nothing of the curtailment of these funds by the expensive as well as cumbersome administrative machinery which would be necessary to administer the means test.

Realizing that Congress may not be prepared at the moment to legislate a complete program, it was suggested that programs to satisfy some of the most urgent health needs be given priority, a procedure similar to that adopted by Congress last year, when it passed the Hospital Survey and Construction Act. Reference was made to the necessity for the expansion of comprehensive preventive services to the entire population of the United States. The fact that 3,000 mothers die needlessly as a result of childbirth and that about 31,000 babies who could have been saved die in their first year demands further support of

maternal and child health services. Funds are urgently needed as well for cancer, heart disease, and diabetes. An especially urgent need relates to medical education and research. Only recently the presidents of 19 American universities joined in a warning of the uncertain future of medical education upon which medical care and public health are dependent. They declared that with present resources few if any of the 70 recognized medical schools of the United States could be confident of maintaining their programs at a high level in the future. Therefore, federal grants-in-aid for medical education and research are needed and may play an important rôle in increasing our scientific knowledge of the prevention, control, and treatment of those diseases before which we are powerless today. It was further suggested that Congress consider strengthening the Hospital Construction program by improving the formula for allocation of federal funds and providing funds for operation and maintenance in the areas of greatest need.

The American Public Health Association is already on record as favoring the establishment of a Cabinet Department of Health, Education and Security by converting the Federal Security Agency into such a department. The creation of a national health agency as an independent agency without Cabinet status as provided in S. 545 is disapproved.

An important oversight is that the Director of the Office of Medical and Hospital Care Services is required by the Bill only to have at least five years of active medical practice and to be "outstanding in the field of medicine." It was pointed out that such experience is seriously inadequate because these positions require years of training and experience in medical and public health administration, subjects not taught in medical schools and rarely included in the experience of private practitioners.

Important also is the fact that although the stated purposes of S. 545 include the phrase "to expand the activities of the Public Health Service," the organizational scheme which is outlined actually reduces the Public Health Service to a subordinate position as one of seven or more constituent units. This might result in the health services of the federal government being administered by a physician unqualified in public health and administration, who might have a position of authority over such highly qualified medical and public health administrators as the Surgeon General of the Public Health Service.

The Association went on record as believing it important to link up preventive and curative medicine, and was of the opinion that the proposed set-up of S. 545 is undesirable. It was believed that the public interest was not properly represented on the national medical care council provided in the Bill, since only three of the nine members represent consumer interest, while five of the nine, an absolute majority, are physicians. It was the opinion of the Association that the power of a national medical care council to overrule the decisions of the director with regard to approval of state plans or modification thereof is contrary to sound administrative practice.

Senate Bill 545 fails to make any provisions for federal or state standards with regard to methods of administration or quality of care. The failure to include such a requirement would permit inefficient administration of the programs by unqualified personnel. The Bill explicitly prevents federal standards of any sort. The Association stated that it was manifest that federal standards have played an important rôle in developing high quality health services at the state and local level.

One feature of the Bill was strongly approved, namely, the plans to establish

a national institute of dental research, but it was believed that the ceiling of a \$600,000 appropriation was too low.

In conclusion, the Association does not consider S. 545 to represent an adequate national health program. Alternative programs have been suggested, such as the expansion of comprehensive public health services both in scope and content, federal aid to medical education and research, and liberalization of federal grants to provide hospital facilities. The proposed reorganization of the federal health services in S. 545 is believed to be administratively unsound. The in-

adequate requirements for the administrators of the medical and dental care programs, the lack of sufficient consumer representation on advisory boards, the power given to national advisory councils to overrule decisions of responsible administrators, the failure to require state plans to set minimum standards of administration and services, and specific prohibition of all federal standards lead to the conclusion that Senate Bill 545 does not sufficiently protect the public interest in the expenditure of public funds for medical care.

APPLICATION FOR HOTEL ACCOMMODATIONS

American Public Health Association, October 6-10, 1947

NOTE: Single rooms are very limited in number. Please arrange to occupy twin-bedded rooms.

HOUSING BUREAU, 16 Central Pier, Atlantic City, N. J.

Please reserve the following:

Hotel .....	First Choice	Hotel .....	Fourth Choice
Hotel .....	Second Choice	Hotel .....	Fifth Choice
Hotel .....	Third Choice	Hotel .....	Sixth Choice

Room(s) with bath for ..... person(s). Rate \$ ..... to \$ ..... per room.

Arriving Atlantic City ..... A.M. Leaving ..... P.M.

NOTE: You will receive confirmation direct from the hotel accepting the reservation when made.

Rooms will be occupied by:

Name	Street Address	City	State
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....

SEVENTY-FIFTH ANNUAL MEETING  
AMERICAN PUBLIC HEALTH ASSOCIATION  
ATLANTIC CITY, N. J., OCTOBER 6-10, 1947

HOTEL RATES, ATLANTIC CITY, N. J.

BOARDWALK HOTELS

Hotels		Total Rooms	Rooms with Bath	
			Single	Double
AMBASSADOR	Brighton Ave.	670	\$6.00-\$9.00	\$9.00-\$14.00
APOLLO	New York Ave.	51		8.00- 12.00
BREAKERS	New Jersey Ave.	475	4.00- 7.00	5.00- 12.00
BRIGHTON	Indiana Ave.	291	7.00-	9.00- 14.00
CHALFONTE-HADDON HALL	North Carolina Ave.	1,000	6.00-10.00	8.00- 18.00
CHELSEA	Morris Ave.	400	5.25- 6.75	6.75- 15.00
CLARIDGE	Park Pl.	406	6.00-14.00	9.00- 17.00
DENNIS	Michigan Ave.	475	6.00- 8.00	9.00- 14.00
MARLBOROUGH-BLENHEIM	Park Pl.	464	6.00-10.00	9.00- 16.00
MAYFLOWER	Tennessee Ave.	280	5.00- 6.00	7.00- 12.00
NEW BELMONT	S. Carolina Ave.	100	5.00- 6.00	7.00- 12.00
PRESIDENT	Albany Ave.	500	7.00-10.00	9.00- 15.00
RITZ-CARLTON	Iowa Ave.	431	6.00- 8.00	9.00- 14.00
ST. CHARLES	St. Charles Pl.	300	5.00-12.00	7.00- 14.00
SEASIDE	Pennsylvania Ave.	235	5.00-11.00	8.00- 14.00
SHELburne	Michigan Ave.	300	6.00- 9.00	9.00- 12.00
STRAND	Pennsylvania Ave.	271	4.50- 6.00	9.00- 12.00
TRAYMORE	Illinois Ave.	600	6.00-14.00	9.00- 18.00

AVENUE HOTELS

Hotels		Total Rooms	Rooms with Bath	
			Single	Double
BOSCOBEL	Kentucky Ave.	120		\$8.00
CLARENDON	Virginia Ave.			7.00
COLTON MANOR	Pennsylvania Ave.	208	\$5.00-\$9.00	8.00-\$12.00
COLUMBUS	Pacific Ave. at St. James	100		6.00
CRILLON ★	Pacific Ave. at Indiana	49		8.00- 10.00
EASTBOURNE	Pacific Ave. at Park	75		7.50- 8.00
FLANDERS	St. James Pl.	125	5.00	7.00- 9.00
FOX MANOR	Pacific Ave. at Belmont	60		8.00- 10.00
HOLMHURST	Pennsylvania Ave.	100		7.00- 8.00
JEFFERSON	Kentucky Ave.	159	6.00	7.00- 10.00
KENTUCKY	Kentucky Ave.	110	3.50	6.00- 7.00
LALAYETTE	N. Carolina Ave.	100	5.00- 6.00	8.00- 10.00
MADISON	Illinois Ave.	210	4.50- 6.00	7.00- 10.00
MONTICELLO	Kentucky Ave.	175		7.00
MORTON	Virginia Ave.	300	5.00- 6.00	7.00- 9.00
HERN ATLANTIC	S. Carolina Ave.	125		7.00
FUNNYHIDE	Park Pl.	75	4.00- 7.50	6.00- 10.00
SENATOR	S. Carolina Ave.	260	4.50- 7.00	7.00- 12.00
STEELE	Kentucky Ave.	83	4.00- 5.00	6.00- 7.00
VILLA D'ESTE	Pacific Ave. at Chelsea	40		8.00- 14.00

★ Price includes breakfast

See Application Blank, preceding page

## WESTERN PUBLIC HEALTH MEETINGS — 1947 MODEL

There was repeated in 1947 a pattern of consecutive state and regional meetings in Western states comparable to that of 1943, 1944, and 1945. Participating in all the meetings was a team organized by the American Public Health Association and made available to the states for their programs. The team members this year consisted of Dr. Mary Crosse, Deputy Senior Assistant Medical Officer of Health (for Maternity and Child Welfare), Birmingham, England; Walter J. Pelton, D.D.S., consultant public health dentist on the staff of the U. S. Public Health Service; James H. Steele, D.V.M., Chief Public Health Veterinarian, U. S. Public Health Service; Eleanor Palmquist, R.N., and Dorothy Rusby, R.N., both Assistant Directors, National Organization for Public Health Nursing; Carl E. Buck, Dr. P. H., Field Director, A.P.H.A.; Francis B. Elder, Engineering Associate, A.P.H.A., William T. Ingram, Engineering Field Associate, A.P.H.A.; Allan Twichell, Technical Secretary, A.P.H.A. Committee on the Hygiene of Housing; Charles B. Frasher, technical consultant in personnel administration, A.P.H.A. Merit System Unit; and Reginald M. Atwater, M.D., Executive Secretary, A.P.H.A.

Beginning with the meeting of the Missouri Public Health Association in Jefferson City the first week of May, the circuit moved on to Minneapolis, where a group of agencies including the State Department of Health, the University of Minnesota School of Public Health, University Continuation Center, and a new organization of public health workers in Minnesota actively participated. At the same time as the Missouri meeting a meeting of the North Dakota Public Health Association was held in Fargo attended by part of the

team, reviewing plans and prospects in that state. This was followed by a one day meeting in Omaha, Neb., at which consideration was given to the wisdom of forming a state-wide organization of public health workers. Special emphasis was placed on the development of full-time city-county health units according to the plan of the State Department of Health.

The fifth meeting of the series was held in Colorado Springs under the auspices of the Colorado Public Health Association. The event of this meeting was the presence of Dr. Florence Sabin of Denver, recently featured through popular magazines for her state-wide activity in the promotion of full-time health service and in the reconstruction of Colorado's public health.

Excellent meetings of the New Mexico Public Health Association and of the Arizona Public Health Association were held respectively in Albuquerque and Tucson. The attendance of these meetings when compared with the number of full-time public health workers in these states was extraordinary, since practically every person physically able to be present was on hand.

The Northern California Public Health Association held a meeting in conjunction with the meeting of the Western Branch of the American Public Health Association in San Francisco the week of May 25. The feature of the program of the Northern California Public Health Association was the address by Dr. Mary Crosse on the care of premature babies in England.

The meeting of the Western Branch brought out more than 800 persons from eleven Western states, several of the Provinces of Canada, Alaska, Hawaii, and the Philippines. An excellent program included addresses by



the Surgeon General of the U. S. Public Health Service, Dr. Thomas Parran, by Dr. Florence Sabin, and other national leaders, but the principal part of the program was contributed by those members of the Western Branch who spoke of programs specially adapted to the Western area and operated in spite of serious difficulty growing out of sparse populations and economic conditions. This meeting was under the Presidency of Karl F. Meyer, Ph.D., who has served during the war years. His successor as President of the Branch is Dr. Florence Sabin, of Denver, recognized as one of the most dynamic leaders in the West at the present time.

The new officers of the Western Branch are:

*President*—Florence R. Sabin, M.D., Denver, Colo.

*President-Elect*—George M. Uhl, M.D., Los Angeles, Calif.

*Vice-President*—Mrs. Sadie Orr Dunbar, Portland, Ore.

*Vice-President*—Lawrence J. Peterson, Boise, Ida

*Secretary*—Walter S. Mangold, Berkeley, Calif.

*Treasurer*—Guy S. Millberry, D.D.S., Los Gatos, Calif.

Subsequent stops were made in Boise for the Idaho Public Health Association, and in Salt Lake City for the Utah Public Health Association where meetings were held in which large numbers participated, including a good many citizens concerned with public health as a social force.

Altogether eleven meetings were held

in this circuit, attended by 2500 persons, a large majority of whom would have found it difficult to attend a national meeting even if it had been held in the territory of the Western Branch. There were many expressions of appreciation for the opportunity to hear competent new speakers and especially to share the British experience as brought out by Dr. Crosse.

Inquiries already have reached the central office with reference to the possibility of a similar team of speakers being organized for a circuit in 1948. The Executive Board has indicated that if such a team is desired and is organized, first priority for the services of the Association team should be offered to states in the territory of the Southern Branch and other parts of the United States where consecutive meetings can be arranged. It is apparent that the Western states again will orient a good many of their state meetings to the meeting of the Western Branch which will be held in Salt Lake City, Utah, the last week of May, 1948. Persons interested in a possible circuit for 1948 should communicate with Dr. Atwater at the A.P.H.A. office.

Appreciation of the American Public Health Association has been extended to the National Organization for Public Health Nursing, the United States Public Health Service, the British Information Services, and other agencies which have coöperated in making the circuit possible, and which have provided the services and travel expense of their representatives.

## THE 1947 EVALUATION PROJECT

During the past twelve weeks, calculating machines and typewriters have hummed steadily in the offices of the Committee on Administrative Practice checking the figures, the additions, and the rates in an effort to give a grade of

GOOD on every single item on 127 Evaluation Schedules received for grading and analysis in the 1947 Evaluation Project.

These schedules were sent in by local health departments in 22 states, the

Territory of Hawaii, and the Provinces of Manitoba, Ontario, and Quebec. Despite shortages of personnel, mass vaccination programs, and other factors which prevented some units from carrying the evaluation project through to completion, participation in 1947 increased 25 per cent over last year.

*State Participation*—State programs, using the evaluation process for improving and extending local public health units, have been inaugurated in Illinois, Kansas, Michigan, Mississippi, New York, and Texas. Since 1942 when this phase of the program was initiated by the Association, Michigan and Texas have accelerated their activity each year, and a large proportion of the 1947 schedules came from those two states—44 from Michigan and 33 from Texas. Under the plan operating in those states, technical field staffs are trained in the use of the *Schedule* in order to stimulate full-time health departments to use it effectively. Standardized record systems are being developed. Grading has been undertaken and the results are then compared with the Association grading. The information thus obtained has been used for program planning, for health education, for more equitable allocation of funds, for inservice training, and in many other ways.

*Local Participation*—Many of the participating units have chosen to submit schedules annually during the past five years or longer. Comparison of the 1947 grading with that for a previous year, in almost every instance, showed decided improvement in the programs. On the schedules the itemization of problems and plans was more carefully thought out than in former years.

Definite evidence of improvement in services stimulated through the use of the Evaluation Process is shown in the following extracts from 1947 schedules: From a Midwest city: "One year ago our *Evaluation* showed that 30 per cent of the cases of active tuberculosis were

at home because they refused hospitalization or left against medical advice. As a means of solving this problem, a medical social worker was secured. This worker has acted as consultant to Health Department nurses and sanatorium superintendent, and has provided direct social service to patients at home, in hospital, and clinic. Now only 15 per cent of active cases are at home, and while 43 per cent of sanatorium discharges were against advice during the year, only 3 per cent left against advice from August 1 to December 15. The social worker is considered to be worth while and will be continued."

From a Southern city: "Attention was focused on the high death rate from diarrhea and enteritis on the 1945 *Evaluation Schedule*. The Health Officer held conferences with pediatricians, reviewed the deaths, and evolved plans for special emphasis on this type of illness. Special instructions were given visiting nurses on care and feeding of small children. There was not a single death from this cause in 1946."

*Health Practice Indices*—Data submitted on schedules from some 300 health departments for the years 1943, 1944, 1945, and 1946 will appear in chart form in the new edition of *Health Practice Indices* now in preparation. The inclusion of data for four years will give a wider spread of units reporting. Although its uses are many for health education purposes, not the least important is to convince governing bodies of the need for increased appropriations. It is less difficult to arouse an interest when citizens can be shown exactly where their community stands among 300 others. If it is high on the chart they want to keep it that way and if it is way down at the bottom, they want to know why.

*The Evaluation Schedule*—In order to keep the *Schedule* up-to-date with prevailing public health practices, it is necessary to revise it periodically. A

Committee on Revisions has been working on a new schedule for months, which will be ready in time for reporting 1947 activities. At present it is being tried out in various parts of the country and, from all reports, health department staffs, not only the health officers but the clerks and typists, find it a vast improvement over the last form. They say it is easier for a beginner to understand. They are also pleased to find that it does not demand excessive record changing. A *Guide* to the use of the new schedule has also been prepared

and it will have a chapter on sampling methods which will make it easier to get information.

*Institutes*—Another regional institute on the Evaluation Process is planned, and will probably be held on the West Coast. It will follow the pattern of those held at the University of Michigan and North Carolina.

The Committee on Administrative Practice will welcome letters telling of uses that have been made of the evaluation material, as well as comments on the new publications.

## Nominations for the Governing Council

In accordance with the By-laws of the Association, the Nominating Committee for Governing Council Members consisting of one Fellow elected by each Section and a Chairman appointed by the Executive Board, reports the following nominations for the Governing Council. The Chairman of the Committee is Earle G. Brown, M.D., Nassau County Commissioner of Health, Mineola, N. Y. The other members are: Frank C. Cady, D.D.S., Dental Health Section; Marietta Eichelberger, Ph.D., Food and Nutrition Section; Alexander G. Gilliam, M.D., Epidemiology Section; Arthur E. Gorman, Engineering Section; Lloyd M. Graves, M.D., Health Officers Section; Myrtle Greenfield, Laboratory Section; Howard W. Lundy, Dr. P. H., Public Health Education Section; Pearl McIver, R.N., Public Health Nursing Section; Hugo Muench, M.D., Vital Statistics Section; C. O. Sappington, M.D., Industrial Hygiene Section; John M. Saunders, M.D., Maternal and Child Health Section; David Van der Slice, M.D., School Health Section.

The By-laws provide that "upon the petition of twenty-five Fellows, the

Nominating Committee shall add the name of any Fellow to the nominees selected by it, provided such petition is received not less than fifteen days before the Annual Meeting."

The terms of ten elective councilors will expire at the time of the Atlantic City Annual Meeting. The ten nominees receiving the highest number of votes on a written ballot cast by the Fellows present and voting at the Annual Meeting will be elected to fill the three year term expiring in 1950.

George Baehr, M.D.  
New York Academy of Medicine  
New York, N. Y.

Ernest Boyce, C.E.  
University of Michigan  
Ann Arbor, Mich.

Robert D. Defries, M.D.  
University of Toronto  
Toronto, Ont., Canada

Sarah S. Deitrick, M.D.  
U. S. Children's Bureau  
Washington, D. C.

C. Mayhew Derryberry, Ph.D.  
U. S. Public Health Service  
Washington, D. C.

Kenneth A. Easlick, D.D.S.  
University of Michigan  
Ann Arbor, Mich.

Marietta Eichelberger, Ph.D.  
Evaporated Milk Association  
Chicago, Ill.

W. Thurber Fales, Sc.D.  
City Health Department  
Baltimore, Md.

Thomas Francis, Jr., M.D.  
University of Michigan  
Ann Arbor, Mich.

Ruth Freeman, R.N.  
American Red Cross  
Washington, D. C.

Edna A Gerken, C.P.H.  
U. S. Indian Service  
Chicago, Ill.

Wilton L. Halverson, M.D.  
State Department of Public Health  
San Francisco, Calif.

Robert H. Hutcheson, M.D.  
State Department of Health  
Nashville, Tenn.

Carl F. Jordan, M.D.  
State Department of Health  
Des Moines, Iowa

Edmund K. Kline, Dr. P. H.  
Cattaraugus Co. Health Department  
Olean, N. Y.

Joseph G. Molner, M.D.  
City Department of Health  
Detroit, Mich.

Rdy J. Morton, M.S.  
Vanderbilt University  
Nashville, Tenn.

Joseph W. Mountin, M.D.  
U. S. Public Health Service  
Washington, D. C.

C. L. Outland, M.D.  
Richmond Public Schools  
Richmond, Va.

John J. Phair, M.D.  
Louisville—Jefferson Co. Health Department  
Louisville, Ky.

Frances C. Rothert, M.D.  
State Board of Health  
Little Rock, Ark.

Emilie G. Sargent, R.N.  
Visiting Nurse Association  
Detroit, Mich.

Fred W. Tanner, Ph.D.  
University of Illinois  
Urbana, Ill.

James G. Townsend, M.D.  
National Institute of Health  
Bethesda, Md.

Huntington Williams, M.D.  
City Health Department  
Baltimore, Md.

Robert E. Wodehouse, M.D.  
Department of Pensions & National Health  
Ottawa, Ont., Canada

#### SURVEY OF STATISTICAL PERSONNEL AND ACTIVITY

A survey of statistical activity and statistical personnel in public health agencies is currently being conducted under the joint auspices of the A.P.H.A. Vital Statistics Section and the U. S. Public Health Service. Questionnaires are being submitted to the chief executives and individual statistical workers in the state and the large city health departments. Valuable information on the following topics is being anticipated when the survey is completed:

1. Salary levels in the various classifications.
2. Factors which have motivated the men and women now engaged in public health

statistics to seek these careers. This piece of information should throw light on the methods which might be used in the recruitment of statisticians.

3. Qualifications and duties of personnel now employed in statistical work in public health agencies. This information should prove important background material for the revision of the report on Educational Qualifications of Public Health Statisticians which is now under revision.

4. Need for in-service and other training programs.

5. Need for reorganization of statistical activities.

6. Degree of the prevailing personnel shortage and its effect on the quality and areas of service given.

It is hoped that a preliminary analysis

of the data will be ready to be presented at the Annual Meeting at Atlantic City.

#### DR. HOWARD M. KLINE RETURNS TO A.P.H.A. STAFF FROM LEAVE

Howard M. Kline, Ph.D., Bethesda, Md., who has served for the last year as Technical Secretary of the Subcommittee on Medical Care of the American Public Health Association, has returned to the staff of the Subcommittee after several months of service as a staff member of the President's Scientific Research Board of Washington. This Board was created by executive order

for the purpose of inventorying all research activities in the United States, with special reference to the research being conducted within the federal establishment and that which is being conducted outside with federal funds. Dr. Kline directed the survey of medical research and conducted special studies incident thereto.

During Dr. Kline's leave the staff of the Subcommittee on Medical Care was guided by Milton Terris, M.D., M.P.H., Medical Associate of the Subcommittee, which is under the Chairmanship of Joseph W. Mountin, M.D.

### APPLICANTS FOR MEMBERSHIP

*The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.*

#### Health Officers Section

Edward W. R. Best, M.D., D.P.H., North Okanagan Health Unit, Vernon, B.C., Canada, Director  
John R. Bourne, M.D., Box 186, Roosevelt, Utah, City Physician  
Thelma C. Buckthorpe, A.B., Box 538, Waynesville, Mo., Acting Health Officer, Pulaski Health Unit  
Wilfred D. David, M.D., 7 Prairie Ave., Newport, R. I., Senior Asst. Surgeon (R), U. S. Public Health Service  
William P. Doherty, V.M.D., 135 Broad St., Bridgeton, N. J., Health Officer  
Milton Feig, M.D., M.P.H., 185 Thompson Shore Rd., Manhasset, N. Y., Fellow U. S. Public Health Service; with Nassau County Health Dept.  
Morris Fiterman, M.D., M.P.H., 6152 Spruce St., Philadelphia 39, Pa., Medical Inspector, Philadelphia Health Bureau  
Kenneth W. Haworth, M.D., M.P.H., 805 Sixth St., Eureka, Calif., Director, Humboldt County Health Dept.  
Samuel L. Henke, M.D., 314 Grand Ave. E., Eau Claire, Wis., Member, State Board of Health  
Michael Lipari, M.D., M.P.H., 34 South St., Middletown, N. Y., Asst. District Health Officer, State Dept. of Health  
Irvin D. Litz, M.D., 218 E. First St., Long Beach 7, Calif., Asst. Health Officer  
Otto Lohman, M.D., 160 Barnard Rd., Manteca, Ill., Health Officer, Manteno State Hospital

Harold C. Miles, M.D., M.P.H., 602 Washington St., Olean, N. Y., Asst. Commissioner, Cattaraugus County Dept. of Health  
W. O. B. Nelson, M.D., Fergus Falls, Minn., Health Officer  
Forrester Raine, M.D., 425 E. Wisconsin Ave., Milwaukee, Wis., Member, State Board of Health  
Harold E. Smith, M.D., Middlefield, Conn., Health Officer  
Robert L. Smith, M.D., 513 N. Rampart St., New Orleans 16, La., Director, Bureau of Tuberculosis Control, City Health Dept.  
Maurice L. Strait, B.S., City Health Dept., Hastings, Nebr., Director of Public Health  
A. B. Tate, M.D., Court House, Russellville, Ark., Medical Director, District 9, State Board of Health  
John H. Venable, M.D., P. O. Box 374, Dalton, Ga., Commissioner of Health, Dalton-Whitfield County Health Dept.  
William F. Wagner, M.D., 401 N. Market, Paris, Tenn., Health Officer II, Tennessee Valley Authority  
Tsu-Hsiang Wang, M.D., M.P.H., 7 Moling Chun, Moling Rd., Nanking, China, City Health Commissioner  
David M. Wolfe, M.D., M.P.H., P. O. Box 127, Albany, Ga., Commissioner of Health, Dougherty County Health Dept.  
Clarence E. Yount, M.D., Masonic Temple, Prescott, Ariz., City Health Officer

#### Laboratory Section

Emma Albert, B.S., 1709 W. Jackson, Chicago,

Ill., Bacteriologist, State Dept. of Public Health  
 Hazel Current, B.S., 918-17th St., Santa Monica, Calif., Hospital Laboratory Worker  
 Walter F. Heintzelman, M.A., State Department of Health, Harrisburg, Pa., Chief, Division of Biologicals and Supplies  
 Enrique Marrero y Vela, D.V.M., Laboratorio Om, Ayestaran 196, Havana, Cuba, Bacteriologist  
 Mary J. McClintock, B.S., Rt. 8, Box 440, Oklahoma City 9, Okla., Bacteriologist, State Dept. of Health  
 Dr. Ludlow R. Stevens, 4712 Leiper St., Apt. E-2, Philadelphia 24, Pa., Research Work in Hematology and Bacteriology  
 Morris R. Shub, B.S., 3905 Eldorado Ave., Baltimore 15, Md., Bacteriologist, Strassburger & Siegel  
 Stanley Villafranca, M.S., Sanatorio "Carlos Duran," Cartago, Costa Rica, C.A., Head of Laboratory

#### *Vital Statistics Section*

Campbell R. Graf, B.A., 2305 Neil Ave., Columbus 1, Ohio, Statistician, State Dept. of Health  
 E. C. Jenkins, City Hall, St. Joseph, Mo., Clerk, Board of Health  
 Goldy D. Kleinman, A.M., 2407 Ocean Front, Santa Monica, Calif., Junior Public Health Analyst, State Dept. of Public Health  
 B. Aubrey Schneider, Sc.D., American Cancer Soc., 47 Beaver St., New York 4, N. Y., Asst. Director, Dept. of Statistics and Special Services  
 Clarence A. Burlage, 1437 Xanthia, Denver 7, Colo., Milk Sanitarian, City Health Dept.  
 Emory J. Cook, Lakemont Dr., Augusta, Ga., Sanitarian, Richmond County Dept. of Health  
 Rolf Eliassen, Sc.D., New York Univ., University Heights, New York 53, N. Y., Professor of Sanitary Engineering, College of Engineering  
 John R. Fleming, B.A., Van Buren County Health Dept., Paw Paw, Mich., Sanitarian  
 Francis R. Girard, State Dept. of Public Health, Fernald Hall, Amherst, Mass., Sanitary Technician  
 Warren P. S. Hall, D.V.M., M.A., 9 Ontario St., Toledo 12, Ohio, Supt. of Food and Sanitation, City Health Dept.  
 Robert M. Kennedy, A.B., 604 Mission St., San Francisco 5, Calif., Assoc. Engineer, Engineering Office of Clyde C. Kennedy  
 Hoyt R. Mason, 70 Fisher Rd., Rochester 11, N. Y., Assistant Sanitary Inspector, Monroe County Dept. of Sanitation  
 R. Kay Matthews, City Hall, Hugo, Okla.,

Sanitarian, Choctaw-McCurtain County Health Dept.

Robert L. Prichard, C.E., 5229 Greenwood Ave., Chicago, Ill., Sanitary Engineer (R), U. S. Public Health Service  
 Rodrigo Puente, C.E., 105 Tejadillo, Cartagena, Colombia, S.A., Sanitary Engineering Student, Univ. of North Carolina  
 Walter M. Scott, 3155 W. 40th Ave., Denver, Colo., Chief Health Inspector, City Health Dept.  
 Henry B. Starr, Jr., 701 Persons Bldg., Macon, Ga., Public Health Sanitarian, State Dept. of Public Health  
 Fred W. Thomas, C.E., Tennessee Valley Authority, Wilson Dam, Ala., Senior Sanitary Engineer  
 Williams L. Timmons, 1215 H. St., Eureka, Calif., Sanitarian, Humboldt County Health Dept.  
 C. William Tresslar, 114 Greenwood St., La-Habra, Calif., Sanitarian, Orange County Health Dept.  
 Frank L. Woodward, B.E., 5821 Elliot Ave., S., Minneapolis 7, Minn., Director, Division of General Sanitation, State Dept. of Health

#### *Industrial Hygiene Section*

Edward R. Hawkins, M.D., 472 Union Ave., Elizabeth 3, N. J., Asst. Plant Physician, Standard Oil Co. of New Jersey  
 Gordon W. Petersen, M.D., Supt., Medical Labs., Kimberly Clark Corp., Neenah, Wis.  
 Ada Chree Reid, M.D., 1 Madison Ave., New York, N. Y., Physician in Charge, Tuberculosis Control Program, Metropolitan Life Insurance Co.  
 Herbert E. Tomlinson, M.D., 905 Smith Tower, Seattle, Wash., Industrial Medical Consultant, State Dept. of Health

#### *Food and Nutrition Section*

Virginia L. Daly, B.S., R.D. 2, Box 627, Clayton 5, Mo., Staff Member, Dairy Council of St. Louis  
 Doris P. Longman, M.S., 175 Jay St., Albany 6, N. Y., Nutritionist, State Dept. of Health

#### *Maternal and Child Health*

Marcella A. Gawronski, R.N., M.A., 402 Bella Vista, Pasadena 8, Calif., Maternal and Child Health Nursing Consultant, State Dept. of Public Health  
 A. W. Kuts-Cheraux, M.D., Dr. P.H., 24 Main St., Bisbee, Ariz., General Practice, Cheraux Clinic  
 Hannah D. Mitchell, B.S., State Health Department, Atlanta 3, Ga., Maternal and Child Health Consultant

*Public Health Education Section*

- Isabel C. Bell, A.B., 1551 Franklin Ave., Mineola, N. Y., Director of Education, Nassaw County Cancer Committee
- Ralph H. Boatman, Jr., B.Ed., 917 Mayo St., Carlinville, Ill., Student, School of Public Health, Univ. of North Carolina
- LeRoy Davenport, D.V.M., 218 Centennial Bldg., Springfield, Ill., Asst. Supt., State Division of Livestock Industry
- Kathleen K. Devine, Metropolitan Life Insurance Co., 1 Madison Ave., New York 10, N. Y., Program Planning and Research, Safety Bureau, Health and Welfare Division
- Dean Halliday, 1900 Euclid Ave., Cleveland, Ohio, Public Relations Director, Anti-Tuberculosis League and Univ. Hospitals
- Salvador Hernandez, M.D., 603 West 138th St., New York, N. Y., Director, Roosevelt Hospital, Guatemala City, Guatemala, C. A.
- Marian V. Hester, A.B., 439 New England Bldg., Topeka, Kans., State Home Management Specialist, Farms Home Administration
- Margaret C. Joyce, R.N., B.S., Rm. 924, County Office Bldg., White Plains, N. Y., Acting Exec. Director, Westchester Tuberculosis and Public Health Assn.
- Clara L. Lankford, M.S.P.H., 204 Second St., Natchitoches, La., Health Educator, State Board of Health
- Mrs. Marty Mann, 2 East 103 St., New York 29, N. Y., Exec. Director, National Committee for Education on Alcoholism
- Jane C. McCoy, M.S.P.H., Wilson County Health Department, Wilson, N. C., Health Educator
- Rufus R. Rosell, B.M.E., 496 Lowry Medical Arts Bldg., St. Paul 2, Minn., Exec. Sec., Minnesota State Medical Assn.
- Amy E. Williamson, M.S., 303 Ninth Ave., New York 1, N. Y., Exec. Sec., Lower West Side District Health Committee

*Public Health Nursing Section*

- Effie S. Andrus, R.N., 116 South State St., Springfield, Ill., Supervising Nurse, Division of Maternal and Child Hygiene, State Dept. of Public Health
- Ruth Bott, Coldwater, Kans., Public Health Nurse, State Board of Health
- Francis K. Crouch, 125 Mt. Vernon St., Ridgefield Park, N. J., Deputy Director, Nursing Service, North Atlantic Area, American Red Cross
- Ann Hoot, R.N., 522 Federal Courts Bldg., St. Paul 2, Minn., District Nurse, Midwestern Agricultural Workers Health Assn.

- Jeanette S. Jackson, 9 Seabury St., Newark, N. J., Student, Univ. of Pennsylvania
- Rella H. Maxwell, 68 Jamestown St., Randolph, N. Y., Staff Nurse, Cattaraugus County Dept. of Health
- Helen G. McArthur, M.A., 95 Wellesley St., Toronto, Ont., Canada, Director of Nursing Services, Canadian Red Cross Society
- Myrtle A. Alson, R.N., 528 S. 8th St., La Crosse, Wis., Supervisor of Nurses, City Health Dept.
- Jeannette E. Potter, B.S., 714 N. 10th St., Tacoma 3, Wash., Educational Director, Tacoma Public Health-Nursing Assn.
- Joyce E. Thompson, B.S., 638 S. Weller, Springfield, Mo., Junior Public Health Nurse, Greene County Health Dept.
- Patricia L. Traver, R.N., Box 22, Rhinebeck, N. Y., Exec. Director, Northern Dutchess Community Nursing Service
- Mary F. Ward, R.N., M.A., P. O. Box 925, Athens, Ga., Asst. Professor of Nursing Education, Univ. of Georgia
- Ethel A. Wilkins, R.N., 209 S. High School, Columbus, Kans., Cherokee County Health Nurse

*Epidemiology Section*

- Merle Bundy, M.D., M.P.H., 3757 N. Bancroft, Indianapolis, Ind., Acting Director, Division of Tuberculosis Control, State Board of Health
- Coleman D. Caplovitz, M.D., St. Louis City Hospital, St. Louis 4, Mo., Intern
- Charles Hillenbrand, M.D., M.S., Warren Clinic, Warren Bldg., Michigan City, Ind.
- Lt. Col. Irvine H. Marshall, M.C., Hq. 4th Army, Medical Section, Fort Sam Houston, Tex., Chief, Physical Standards
- Milton S. Parker, A.B., Hampton Roads Medical Center, P. O. Box 749, Norfolk 1, Va., Research Investigator, Venereal Disease Division, U. S. Public Health Service
- George W. Weber, M.D., Ulster County Tuberculosis Hospital, Kingston, N. Y., Medical Director

*School Health Section*

- Norma C. Beckman, R.N., B.S., 3058 N. 51st St., Milwaukee, Wis., Instructor in Public Health Nursing, Marquette Univ.
- Virginia J. Cook, B.S., 902 Chapel St., Rm. 615, New Haven, Conn., Asst. Exec., New Haven Tuberculosis and Health Assn.
- Ruth E. Cowles, A.B., 1426 Woodrow Ave., Wichita 3, Kans., School Nurse, Board of Education
- John C. Danahy, M.D., 216 East Ninth St., Cincinnati 2, Ohio, Director, Division of

### Health and Hygiene, Cincinnati Public Schools

Ciwa Griffiths, M.S., 4761 Date Ave., Apt. 1, La Mesa, Calif, Specialist in Speech and Hearing, San Diego County Schools

Helen N. Tarbox, R.N., 243 Winthrop St., Winthrop, Mass., Health Supervisor, School Dept.

### Dental Health Section

J. W. Owen, D.D.S., First National Bank, Lexington, Ky., Dental Director, State Health Dept.

Samuel Plotnick, D.D.S., M.P.H., 1106 Morris Ave., Bronx 56, N. Y., Dentist, St. John's Guild

### Unaffiliated

Jerome Beller, D.V.M., 1914-66 St., Brooklyn 4, N. Y., Consultant Veterinarian, U.N.R.R.A.

Thomas D. Fridena, M.D., 717 N. Sixth, Tucson, Ariz., Gynecologist

Ralph F. Vaccare, M.P.H., Assn. of American Railroads, 1103 W. Pratt St., Baltimore 23, Md., Bacteriologist, Sanitation Research Project

Major William L. Vogt, M.C., Manhattan Eng. Dist., Oak Ridge, Tenn.

Marceil Young, 8161 N. Druid Ave., Portland 3, Ore., Exec. Secy., Agricultural Workers Health Assn.

The following footnote to the article by Dr. Edward S. Rogers, which appears on page 1017, was received too late to be inserted in its proper place. We are, therefore, taking this means of presenting the names of the members of the Committee.

U. S. Subcommittee of the International Conference for Revision of the *International List of Causes of Death*:

George Baehr, M.D.  
Mount Sinai Hospital  
New York, N. Y.

F. S. Burke, M.D.  
Department of Health and Welfare  
Ottawa, Ont., Canada

Selwyn D. Collins, Ph.D.  
(member of working subcommittee)  
U. S. Public Health Service  
Bethesda, Md.

Edwin L. Crosby, M.D.  
The Johns Hopkins Hospital  
Baltimore, Md.

Halbert L. Dunn, M.D.  
(member of working subcommittee)  
U. S. Bureau of the Census  
Washington, D. C.

W. Thurber Fales, Sc.D.  
(member of working subcommittee)  
City Health Department  
Baltimore, Md.

J. T. Marshall  
Dominion Bureau of Statistics  
Ottawa, Ont., Canada

J. C. Meakins, M.D.  
McGill University  
Montreal, Que., Canada

Lowell J. Reed, Ph.D., Sc.D.  
The Johns Hopkins University  
Baltimore, Md.

Edward S. Rogers, M.D.  
University of California  
Berkeley, Calif.

J. Wyllie, M.D.  
Queen's University  
Kingston, Ont., Canada

### Consultants to Committee:

Percy Stocks, M.D.  
(member of working subcommittee)  
General Register Office  
London, England

Yves M. Biraud, M.D.  
(member of working subcommittee)  
League of Nations  
Geneva, Switzerland

A. H. T. Robb-Smith, M.D.  
(member of working subcommittee)  
Oxford, England

Iwao M. Moriyama, Ph.D.  
(member of working subcommittee)  
U. S. Bureau of the Census  
Washington, D. C.

Winifred O'Brien, R.N.  
(member of working subcommittee)  
Dominion Bureau of Statistics  
Ottawa, Ont., Canada



## EMPLOYMENT SERVICE

The following pages present information for those seeking qualified public health personnel and for those seeking positions in public health.

This is a service of the Association conducted without expense to the employer or employee.

Address all correspondence to the Employment Service, A.P.H.A., 1790 Broadway, New York 19, N. Y., unless otherwise specified.

### POSITIONS AVAILABLE

(Supplemental to list in July Journal)

**Public Health Commissioner in Tuscarawas County, New Philadelphia, Ohio.** Must have degree in Public Health. To serve in a county with a population of approximately 40,000. Beginning salary \$6,000 or more. Write Box C-2, Employment Service, A.P.H.A.

**Health Officer:** salary \$6,000. Requirements: Graduation from medical school of recognized standing, three years' practice of medicine, graduate of recognized school of public health with at least one year's attendance. Full-time position. City of 27,000. Apply Board of Health, Middletown, Conn.

**Public Health Engineering Laboratory in Central States region** has opening for **Sewage and Wastes graduate chemist**, 3 years' experience expected, preferably in similar laboratory work. Position requires some field investigations. Salary range \$230-\$290. Write Box B-2, Employment Service, A.P.H.A.

**Public Health Nurses.** (1) Two positions for experienced nurses (beginning salary \$2,400, must furnish automobiles, mileage allowance). (2) Two junior grade positions, (beginning salary \$2,100, mileage allowance). Full-time health unit including six counties in picturesque rural Badlands area. Generalized program. Write Mary E. Soules, M.D., District Health Officer, Southwestern Health Unit, New England, N. D.

**Associate Bacteriologist,** College degree, one year training in public health laboratory, two years' experience. Five day week. Salary \$2,750. Write William A. Dorsey, Laboratory Director, Arlington County Laboratory, P. O. Box 151, Arlington, Va.

**Sanitary Chemist or Engineer** for staff position in engineering school, southeast. To do research work (methods of water and sewage analysis) which can be applied toward advanced degree; also will have to carry some undergraduate teaching. Write Box E-512, Employment Service, A.P.H.A.

**Director of Public Health Nursing for Columbia County Dept. of Health.** Apply: Columbia County Dept. of Health, 612 Warren Street, Hudson, N. Y.

**Health Officers (M.D.)** for several important city-county and other local health department openings in West Virginia. Some of the positions carry teaching responsibilities, implementing the basic salary of \$6,000. Physicians are encouraged to apply even if lacking public health training or experience; must be below 35 years at first public health appointment. Write Bureau of County Health Work, West Virginia Dept. of Health, Charleston, W. Va.

**Specialized Consultant Nurses** in the following programs—Tuberculosis, Maternal and Child Health, School Health Service. Requirements include bachelors degree with major in public health nursing, advanced preparation in the specialty and one year of experience in generalized supervision. Travel allowance. Salary open. Write Director, Division of Public Health Nursing, State Board of Health, Jackson, Miss.

**Negro M.D.—Assistant Director School Health Service** in Nashville, Tenn. Public Health experience desirable but not absolutely necessary. Staff of three doctors and twelve nurses doing broad school health program in metropolitan area. Chance to affiliate with Meharry Medical School. Salary open, 12 months. Eligible for Civil Service if under 40. Communicate Director School Health Service, Nashville, Tenn.

**Health Officer** wanted, September through June to substitute while on educational leave. Illinois County of 35,000, 100 miles from Chicago. Salary \$515 per month plus \$69 month's travel. Two weeks sick leave and three week vacation leave provided, annually. Lee County Health Department, 123 East First Street, Dixon, Ill.

**Experienced, trained man for Public Health Executive position** in San Mateo

County, California. Starting salary \$7,788 per year, increasing annually over four years to \$9,732. Write Civil Service Commission, Courthouse, Redwood City, Calif.

**Industrial Hygiene Chemist**, five years' experience. Graduate of accredited college with major in chemistry. Salary \$325-\$425 per month, plus travel expenses. State Civil Service position with vacation, sick leave, and retirement privileges. Send brief outline with request for application form to State Health Officer, Louisiana State Department of Health, New Orleans 7, La.

**Public Health Nurses** in official generalized program of Washtenaw County, Michigan, at Ann Arbor. Agency is field teaching center for University of Michigan. Opportunity to study at University.

**Health Officers and Physicians wanted:** Pinellas County (St. Petersburg, Clearwater), man with public health experience, training, beginning salary \$7,200; Leon County (Tallahassee), beginning salary \$6,000; several counties open shortly. Younger men preferred; persons must be below 45 when entering public health for first time. Also tuberculosis and venereal disease clinicians, psychiatrists, general medical men needed for State Board of Health, County Health Units and State institutions. Beginning salaries range from \$5,000 to \$6,000. Younger men preferred. Write or wire Supervisor, Florida Merit System, P. O. Box 1136, Tallahassee, Fla.

**Chief of Division of Maternal and Child Health** in new industrial community. Salary \$6,000 plus car for official business. Forty-four hour week, annual and sick leave. Housing available at reasonable cost. Write Box G-2, Employment Service, A.P.H.A.

**Health Officer**, Midwestern city of approximately 75,000. Should have training in public health work or be willing to take such training. For information write to Box F-2, Employment Service, A.P.H.A.

**Trained and experienced Health Officer** for new Quadri-County Health Department; population 41,000; Midwest; mostly agricultural. Salary \$7,200 plus travel. Write Box E-2, Employment Service, A.P.H.A.

**Public Health Nurse** to inaugurate a visiting nursing service for the Santa Maria Valley Chapter of the American Red Cross. Experienced person desired. Minimum salary \$3,000. Car furnished. Write qualifications to Mrs. Chester M. Langenbeck, 602 E. Main Street, Santa Maria, Calif.

**Public Health Nurse** for tuberculin testing demonstrations—a lend-lease project with county tuberculosis associations. Nurse to give and read Mantoux tests, be capable of supervising or conducting pre-educational work and community organization. Must have car. Salary \$3,000 to \$3,600 annually, plus living and travel expenses. Write Box D-2, Employment Service, A.P.H.A.

**City Health Officer** to serve industrial city of 20,000 population on full-time basis; opportunity to develop school medical and child health services in cooperation with community agencies. Reply in detail to Board of Health, City Hall, North Adams, Mass.

**Physician** experienced in tuberculosis for position of Assistant Director of Tuberculosis Control in city-county health department of midwest community; \$4,500 with full maintenance. Write Box A-3, Employment Service, A.P.H.A.

**Supervising Public Health Nurse:** in Marin County Health Department for an expected vacancy. California registration and P.H.N. Certificate required; qualifications comparable to either those of the California State Health Department or preferably to those of the A.P.H.A. Generalized program with six staff nurses in semi-rural county immediately north of San Francisco. Mileage supplied on private car at 8¢ per mile. Expected starting salary \$250. Write Miss Elizabeth Newell, Supervising Nurse, Marin County Health Department, 704-4th Street, San Rafael, Calif.

**Director of Public Health Nurses:** same agencies and comparable qualifications; a new position expected to be created at \$300 per month beginning salary. Write: Irving D. Johnson, M.D., Marin County Health Officer, Marin County Health Department, 704-4th Street, San Rafael, Calif.

**Industrial Hygiene Physician.** Minimum of three years medical experience with major emphasis in the field of Industrial Hygiene, supplemented by one year postgraduate training in a school of public health with studies in Industrial and Occupational disease control. Salary range: \$6,000 to \$7,200. Start exceptionally well qualified person at \$6,480. Under Civil Service and Retirement. Apply to: Mr. A. T. Johnson, Personnel Director, Oregon State Board of Health, 1022 S.W. 11th Avenue, Portland 5, Ore.

**Associate Bacteriologist** in charge of clinical laboratory in Eastern State Health Department. B.S. degree plus three years' experience, thorough foundation in chem-

istry and background in bacteriology are requisites. New position with teaching duties. Beginning salary \$3,600, annual increments. Write Box I-3, Employment Service, A.P.H.A.

**Bacteriologist for Director of Laboratory, State Health Department.** Ph.D. required. Background in serology, clinical bacteriology, and public health necessary. Salary range \$4,560-\$5,460. Write Box B-3, Employment Service, A.P.H.A.

**Public Health Nurse—In Out-patient department, for follow-up work and supervision of clinic.** Secretary; station wagon furnished. Salary \$175 per month and full maintenance. Ideal working and living conditions. Must be between ages of 22 and 45. Contact Paul D. Crimm, M.D., Bohne Tuberculosis Hospital, Evansville 12, Ind.

**Several Qualified Public Health Officers in Texas.** Salary range \$5,500 to \$7,500 per year plus travel allowance. Apply to: Dr. Geo. W. Cox, State Health Officer, Austin, Tex.

**Physical Therapists and Senior Physical Therapists for State Health Department.** Physical therapists must be graduates from a school of physical therapy approved by the A.M.A. and registered in the American Registry of physical therapists. Salary \$220-\$260 per month. Senior positions require two years' experience. Salary \$250-\$300 per month. Write Merit System Supervisor, State Personnel Board, Seattle 4, Wash.

**Health Officer for Saint Joseph, Mo.** Graduation in medicine from a grade A medical school and not less than two years of full-time experience in public health work, or, one year of such full-time experience and the completion of a course in public health of not less than one year in residence at a recognized institution of learning required. Write E. C. Jenkins, Clerk, Board of Health, Saint Joseph, Mo.

**Public Health Nurse for generalized Public Health Program.** Salary to start \$2,500. Must register in Connecticut. City of 40,000 people. Five Parochial Schools included in work. Dependability a necessity. Retirement Fund. Must drive car. Apply: Health Officer, 47 Main Street, Bristol, Conn. Give qualifications and experience.

**Two Public Health Nurses for growing Health Department in southeastern Michigan.** Opportunity to work under supervision. Also opportunity for some postgraduate training at nearby School of Public Health. Must have completed one

year in recognized school of Public Health. Salary range \$2,400-\$2,600, plus travel. Write H. C. Huntley, M.D., Director, Lenawee County Health Department, Adrian, Mich.

**Director of Industrial Hygiene in West Virginia State Department of Health, Charleston.** Salary \$6,000 plus travel. Position under state merit system. Qualifications: M.D. with two years' full-time professional experience in the field of industrial hygiene. Must be eligible for West Virginia license. Write Dr. N. H. Dyer, State Health Commissioner, State Department of Health, Charleston 5, W. Va.

**County Health Officers in the West Virginia State Department of Health.** Salaries from \$4,440 to \$6,000 per annum, plus travel allowance, depending on training and experience. Position under state merit system. Qualifications: M.D. with at least two years of full-time professional experience in the field of public health. Must be eligible for West Virginia license. Write Dr. N. H. Dyer, State Health Commissioner, State Department of Health, Charleston 5, W. Va.

**Health Officer for newly established Bi-County Health Department in Central Illinois.** Combined population approximately 33,000, mostly agricultural. Staff of eight contemplated. Trained and experienced physician wanted to fill the position. Excellent public support. Salary \$7,200 plus travel. Write: Mr. E. R. Rinehart, Secretary, DeWitt-Platt County Board of Health, Farmer City, Ill.

**City Biochemist.** \$400 to \$500 per month plus \$48.96 cost-of-living. Two years' practical experience directing biological laboratory or comparable experience; postgraduate training equivalent to M.A. and preferably Ph.D. in one of the sanitary sciences. Applications received until needs of service filled. Write Personnel Department, City Hall, Madison 3, Wis.

**District Health Officers for the State of Washington.** Requirements: Graduation from an approved medical school, 1 year internship and 3 years in professional medical work; or 1 year in professional medical work and 1 year's study in school of public health. Salary \$6,000 to \$7,140. Exceptional candidates can start above the minimum level. Write State Personnel Board, Washington State Dept. of Health, Smith Tower, Seattle 4, Wash.

**Two Public Health Nurses to teach in midwestern university.** One responsible for certificate level program. One to develop program of study for graduate

nurses preparing to integrate social and health aspects in basic schools of nursing. Must have Master's degree and a good combination of public health nursing experiences including supervision. Preference given to those with teaching experience. Beginning salary \$4,000 for ten month contract. Write Box N-398, Employment Service, A.P.H.A.

Director of Nutrition for Red Cross Chapter in a midwestern metropolitan center. Candidate must have sound nutrition background and experience in community activity. Excellent opportunity to develop a broad program on a long-term basis with coöperation from health, education, social welfare, and business leaders. Salary open. Write Box E-3, Employment Service, A.P.H.A.

Public Health Nurses are needed in Georgia. The State and County Departments of Public Health in Georgia invite qualified public health nurses to apply for permanent positions in Georgia. Staff nurses must have a minimum of six months' postgraduate public health nursing education in addition to acceptable basic training. Salaries Range from \$2,100 to \$2,340 in addition to a liberal travel allowance. Supervisory nurses must have at least two years' experience in public health nursing as well as one academic year of postgraduate training in public health nursing. Salaries range from \$2,400 to \$3,000 in addition to travel allowances. Scholarships are available for graduate nurses who are interested in receiving public health nursing training. Write Personnel Administrator, State Health Department, Office Building, Atlanta, Ga., for application forms and full details:

Graduate in Bacteriology with some background in chemistry and experience in field of sewage and water research or treatment. To take charge of section in newly organized research project. Eastern United States Salary \$3,200-\$4,200 depending upon qualifications. Write Box L-535, Employment Service, A.P.H.A.

Health Agency Executive desires position as Director of Health Council or Voluntary Agency. Excellent experience in health interpretation. Community organization and coordination. Wishes permanent residence West Coast or Southwest. Write Box A-527, Employment Service, A.P.H.A.

Bacteriologist, Ph.D., 29, Yale, Academic, industrial and medical research experience. Background in biochemistry,

Sanitarian with experience in food handling and restaurant sanitation. Age 25 to 40 preferred. Health department experience necessary. Starting salary \$3,000 plus ample travel allowance. Must be well educated and diplomatic. State education, experience, and age in reply. Must have own car. State of Wyoming. Write State Health Officer, Cheyenne, Wyo.

School Physician for school district with a school population of more than 10,000. To take complete charge of the elementary program. Salary approximately \$6,000. West Coast. Write Box D-3, Employment Service, A.P.H.A.

1. Sanitary Engineer with training and experience. Maximum salary \$4,200.
2. Sanitarian with experience in food and milk control, salary up to \$3,000, for County Health Department, Southeast. County seat in large urban center. Write Box E-516, Employment Service, A.P.H.A.

Physician with experience or training in public health for Director of county health unit; headquarters in Bisbee, Ariz.; population 39,000; salary dependent upon training and experience; liberal flat rate for travel allowance. Apply Chochise County Health Service, Box 1193, Bisbee, Ariz.

Health Officers: Positions are open in Georgia for county and district commissioners of health. Salaries for experienced public health physicians range from \$6,600 to \$7,500. Salaries for physicians with public health training who are entering the field range from \$5,640 to \$6,840. Liberal travel allowances supplement these salaries. Tenure of office is assured by a merit system. License to practise medicine in Georgia is required. Ample opportunities for training are offered with liberal stipend while in training. Write T. F. Abercrombie, M.D., Director, State Health Department, State Office Building, Atlanta 3, Ga., for application forms and full details.

#### POSITIONS WANTED

immunology and parasitology. In charge of U. S. Government laboratories, food and water control, health programs (malariaology), mass immunization, etc., in several foreign countries (including tropics) during war years. Training in statistics, pharmacology, pathology. Write Box L-531, Employment Service, A.P.H.A.

Former Sanitary Engineer (RC) Public Health Service, long experience, now em-

ployed, desires position sanitary engineer or director sanitation with municipal or local health unit. Write Box E-514, Employment Service, A.P.H.A.

**Graduate Social Worker.** Degree in Community Organization. Experience: public relations and interpretation for health agency; intake worker. Committee work. Some case work with patients; also health education. Good at programming. Negro. Write Box M-502, Employment Service, A.P.H.A.

**Position as Educational Research Worker** in public health and/or community educator with special reference to planning and organizing programs in sanitation and other phases of public health. Trained in education, social work and public health, with doctorate in latter field. Writing experience with public health agencies in preparing copy for

newspaper and other publications; several years of field experience in sanitation. Position in West or Midwest preferred. Write Box C-3, Employment Service, A.P.H.A.

**Parasitologist**, male, 28 years old, B.S., some graduate training. Six years' experience in the field of parasitology in civilian governmental agency, army, university and industrial laboratory. Experience includes routine examinations, field work and research in parasitology and some serology. Write Box L-533, Employment Service, A.P.H.A.

**Recent Graduate Veterinarian (KSC '47)** desires employment. Have had experience working for the Health Department of the District of Columbia. Age 32, married, no children. Write Box 304, Employment Service, A.P.H.A.

### Advertisement

## Opportunities Available

**WANTED—(a)** Obstetrical consultant, tuberculosis consultant and, also, two district public health officers; headquarters in large city of Pacific Coast; salaries dependent upon qualifications, \$5,520–\$7,140. **(b)** Two physicians, man and woman, to join staff, university health service; enrollment of 18,000; teaching appointments if desired. **(c)** Chief of division of maternal and child hygiene; town of 45,000; new home available; \$6,000 including car and expenses. **(d)** City commissioner; town of 50,000; Middle West. **PH8-1** Medical Bureau (Burnice Larson, Director), Palmolive Building, Chicago 11.

**WANTED—(a)** Health educator to serve as consultant; preferably one with minimum Master's degree and three years' experience; \$3,600–\$4,800; West. **(b)** Sanitary engineer; degree in sanitary or public health engineering required; full-time teaching, university school of public health; West. **(c)** Health

educator; county tuberculosis association; town of 100,000; Middle West. **PH8-2** Medical Bureau (Burnice Larson, Director), Palmolive Building, Chicago 11.

**WANTED—(a)** Two public health nurses for faculty appointments; middle western university; ranks dependent upon qualifications; 10 month year; \$4,000–\$5,000. **(b)** School nurse; duties include counseling of girls; high school of small town adjoining Chicago; \$2,400–\$3,700 for nine month year. **(c)** Executive director; educational program for staff members; non-official agency having generalized nursing program; East. **(d)** Industrial nurse; plant having 1,000 employees; Middle West. **(e)** Several public health nurses; one should be interested in supervising; knowledge of Spanish required. **PH8-3** Medical Bureau (Burnice Larson, Director), Palmolive Building, Chicago 11.

### Advertisement

## Opportunities Wanted

**Public Health physician**; B.S., M.D., Middle Western school, M.P.H., Johns Hopkins; eight years administrative experience in public health and industrial health; for further information, please write Burnice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

**Yale dentist**, D.D.S. University of Pennsylvania; five years on staff of department of dentistry of large hospital. For further information, please write Burnice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

**Health Educator**; B.S., Sanitary Engineering; Master's in Public Health Education; three years, sanitary engineer, municipal department of health; four years, health educator, state health department; for further information, please write Burnice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

**Public Health nurse seeks administrative appointment**; B.S., M.A. degrees; eight years' public health experience including five as educational director, public health program; for further information, please write Burnice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

## NEWS FROM THE FIELD

### U. S. PRESIDENT'S 1947 HEALTH MESSAGE

On May 19, the President of the United States transmitted to Congress a message recommending the development and enactment of national health and disability insurance programs. He summarized the outlines of a long-range health program as presented in his earlier health message of 1945. Such a program, he declared, must include:

1. Adequate public health services, including an expanded maternal and child health program
2. Additional medical research and medical education
3. More hospitals and more doctors in all areas of the country where they are needed
4. Insurance against the costs of medical care
5. Protection against the loss of earnings during illness

In making a plan for adequate medical and dental care for children, for early care of illness now often delayed because of the high cost of medical care, for the better distribution of doctors, dentists, and hospital facilities, the President said "A national health-insurance program is a logical extension of the present social security system which is so firmly entrenched in our American democracy. Of the four basic risks to the security of working people and their families—unemployment, old age, death, and sickness—we have provided some insurance protection against three. Protection against the fourth—sickness—is the major missing element in our national social-insurance program."

On May 20, Senators Murray, Wagner, Pepper, Chavez, McGrath, and Taylor introduced Senate Bill 1320 designed to carry out the purposes stated in the President's message. This bill

follows very closely the Wagner-Murray-Dingell bill of last year's Congressional Session but strengthens the provisions guarding against federal control. In the new bill, administration is vested in a National Health Insurance Board rather than in the single person of the Surgeon General of the U. S. Public Health Service. It also provides for a national Medical Advisory Council.

The bill provides for a national insurance system of prepaid personal health services with decentralized administration to be carried out by state and local agencies, authorizes federal grants-in-aid to pay premiums for those unable to pay premiums out of their own earnings, for the establishment of community-wide public health and maternal and child health services, and for medical research or professional education relating to the prevention of disease and disability. It covers all employed and self-employed, including domestic and agricultural workers now largely excluded from the benefits of the Social Security Act.

### DR. HILLEBOE, NEW YORK STATE HEALTH COMMISSIONER

On July 1, 1947, Governor Dewey of New York announced the appointment of Herman E. Hilleboe, M.D., as New York State Health Commissioner. He was previously assistant Surgeon General and Associate Chief of the Bureau of State Services of the U. S. Public Health Service. Since 1942, he has been in charge of tuberculosis control activities of the Service.

Dr. Hilleboe received the degree of Doctor of Medicine from the University of Minnesota Medical School; had graduate training in pediatrics at the University Hospitals, and received the

Master of Public Health degree from the Johns Hopkins School of Hygiene and Public Health.

Shortly after assuming office, Dr. Hilleboe left for a three week tour of Europe to study health and tuberculosis problems on the continent and to attend three international meetings. He attended the meeting in Paris July 27 and 28 of the International Union Against Tuberculosis as one of the five American delegates representing the National Tuberculosis Association. He was the American delegate on the four-man Expert Committee on Tuberculosis of the World Health Organization's Interim Commission, and attended a meeting in Paris with the Danish, English, and Russian members of this Expert Committee. He was also the American representative of the U. S. Public Health Service at the International Congress on Microbiology in Copenhagen, July 17-18.

Dr. Hilleboe is a member of the following scientific societies: American College of Chest Physicians, American Epidemiological Society, American Medical Association, American Public Health Association, of which he is a Fellow, American Statistical Association, American Trudeau Society, Mexican Society Against Tuberculosis, National Tuberculosis Association, and the Tuberculosis Association of India.

Dr. Hilleboe has over 60 publications in the medical and public health literature published from 1931 to 1947. He is co-author with Dr. Russell H. Morgan, Professor of Radiology at Johns Hopkins Medical School, of the book, *Mammography of the Chest*, published in 1945.

Dr. Hilleboe has returned to the United States and is now in active charge at the New York State Health Department. Among the programs which have been set for this department is the elimination of tuberculosis in the state within the next 25 years.

#### NEW JERSEY'S STATE HEALTH DEPARTMENT REORGANIZATION

Both the Assembly and Senate of New Jersey passed the State Health Department Reorganization Bill by large majorities. It provides for a State Health Department and a Commissioner charged with the duty of formulating comprehensive policies for the promotion of public health and the prevention of disease within the state. It provides also for a Public Health Council with power to make sanitary regulations. The Commissioner is empowered to establish, with the approval of the Public Health Council, such health districts as may seem necessary.

The Public Health Council under the new law prescribes the qualifications of health officers and sanitary inspectors for local health departments. No medical qualification for health officers is written into the law.

Although included in the bill as introduced, the Act as passed does not require a public health degree or at least a year of graduate study in public health as a qualification of the state health commissioner.

A county health department bill, also introduced into the recent legislature, failed to reach the floor of either house.

The members of the new Health Council who have been appointed for terms of from one to seven years respectively are as follows:

- Harvey N. Davis, Sc.D., President, Stevens Institute of Technology
- Wheeler McMillen, Editor, *Form Journal*
- Frederick P. Lee, M.D., Health Officer, Paterson
- Walter G. Alexander, M.D., former State Board of Health member, and practicing physician
- Marcus W. Newcomb, M.D., practicing physician
- Florence M. Farr, lay member of New Jersey State Organization for Public Health Nursing and other nursing and health organizations
- Henry N. Landall, Professor of Municipal and Sanitary Engineering, Rutgers University

#### NATIONAL CANCER INSTITUTE OF CANADA CREATED

To coordinate all efforts in cancer control in Canada on a national basis, the Minister of the National Health and Welfare called a conference of representatives from all organizations working in the cancer field in Canada, as a result of which the National Cancer Institute of Canada was organized. It will (1) provide for the education and subsistence of cancer research workers; (2) provide undergraduate and post-graduate education for physicians, and attempt to establish a uniform system of reporting cancer cases and deaths throughout the Dominion; (3) continue the lay educational program now being conducted by the Canadian Cancer Society; and (4) raise funds to support the work of the institute.

Dr. Allan W. Blair, Regina, Sask., was recently appointed Managing Director. The first project planned by the institute is an immediate survey of all cancer facilities for diagnosis, treatment, and research in Canada.

#### STATE AID FOR LOCAL HEALTH DISTRICTS IN CONNECTICUT

Under the headline, "A Milestone in Connecticut Public Health Program," the Connecticut State Department of Health *Weekly Bulletin* reports the passage on June 4 of House Bill 175 by the State's General Assembly. A similar bill had been defeated in three previous successive Assembly sessions.

The Health District Bill permits two or more towns, cities, and boroughs to unite into a locally self-governing district department of health, and authorizes the state to pay up to 50 per cent of the cost of operating such a department. This is limited by a ceiling of \$4,000 available to any one municipality, and \$20,000 to any one district. An appropriation of \$25,000 was made for financing district health departments during the biennium 1947-1949.

The Connecticut *Bulletin* points out that, although this is a modest appropriation, "it represents the beginning of a program which may eventually make extensive public health services available to all Connecticut communities." It urges communities to "convince local boards of selectmen that full-time local departments of health are desirable and necessary." "First come—first served," it urges.

#### HOUSING SEMINAR

In June the Department of Public Health of Yale University held a three day Seminar on the Hygiene of Housing in cooperation with the A.P.H.A.'s Committee on the Hygiene of Housing, the Connecticut State Health Department, and the New England districts of the U. S. Public Health Service and the Federal Public Housing Authority. The purpose of the Seminar was to bring to the attention of state and local health and housing officials up to date information on housing. "That health departments will continue to have an increasing stake in housing activities is self-evident," declared the program announcement.

Among the speakers were C.-E. A. Winslow, Dr.P.H., on the "Basic Principles of Healthful Housing," and Allan A. Twichell on "Appraising the Quality of Urban Housing." They are respectively Chairman and Technical Secretary of the Association's Committee on the Hygiene of Housing.

The conference was attended by a representative group of health officers, sanitation personnel, and housing officials from the Northeastern States.

#### INTERNATIONAL CONGRESS OF NURSES

The first post-war Congress of the International Council of Nurses was held in Atlantic City in May. It was attended by 6,600 professional nurses, 748 of them from 38 nations outside of the United States. This was the first



Congress of this Council since the one held in London in 1937. The next Congress, celebrating the fiftieth anniversary of its founding, will be held in Stockholm in June, 1949.

The Congress adopted the findings of a Study Committee calling for an enlarged program, including a Bureau of Education in the Council, and for a return of headquarters to London as soon as feasible.

Officers elected at the May meeting were:

*President*—Gerda Hojer, President, Swedish Nurses' Association

*First Vice-President*—Mary I. Lambie, Director, Division of Nursing, New Zealand Health Department

*Second Vice-President*—Katherine J. Densford, President, American Nurses' Association

*Third Vice-President*—Grace M. Fairley, formerly Director of Nurses, Vancouver (B. C.) General Hospital

*Treasurer*—G. E. Davies, formerly Registrar, General Nursing Council for England and Wales

#### MISSOURI PUBLIC HEALTH ASSOCIATION

The Missouri Public Health Association elected the following new officers at its recent Annual Meeting:

*President*—William J. Dixon, Kansas City

*President-Elect*—Alexander E. Murphy, D.D.S., St. Louis

*1st Vice-President*—Lucille Whitesides, R.N., Jefferson City

*2nd Vice-President*—William F. McCarthy, M.D., Independence

*Treasurer*—John Buxell, St. Louis

*Secretary*—Margaret Willhoit, R.N., Kansas City

#### GEORGIA PUBLIC HEALTH ASSOCIATION

The Georgia Public Health Association elected the following new officers at its Annual Meeting held in Atlanta, June 9-11.

*President*—M. E. Winchester, M.D., Brunswick

*President-Elect*—C. A. Henderson, M.D., Savannah

*Vice-President*—J. A. Willman, Columbus

*Secretary-Treasurer*—Louisa G. Lenert, Atlanta

*Representative on A.P.H.A. Governing Council*—Louisa G. Lenert, Atlanta

#### PUBLIC HEALTH ASSOCIATION OF NEW YORK CITY

The Public Health Association of New York City met at the Hotel Martinique on the afternoon and evening of June 2. Two section meetings were held in the afternoon, one on environmental sanitation and one a spirited panel discussion on the future of voluntary health agencies in the light of increasing appropriations and trained personnel in official federal, state, and local health departments. The speakers at the dinner meeting were Dr. Jerome S. Peterson on "Public Health Progress as I Saw it in China," and Ralph G. Albrecht, attorney, on "The Nuremberg Trial."

Dr. John L. Rice, former City Health Commissioner of New York was elected President. Other officers were:

*1st Vice-President*—Helen Crosby

*2nd Vice-President*—Dr. Jacob A. Goldberg

*Secretary-Treasurer*—Charles A. Freck

*Representative to the A.P.H.A. Governing Council*—Frank Kiernan

*Members of the Executive Board*—Jean South, Sophie P. Williams, Dr. Michael Antell, Dr. Thomas D. Dublin, Dr. Franklin Foote, Dr. Jerome S. Peterson, and Mr. Kiernan.

#### IDAHO PUBLIC HEALTH ASSOCIATION

The following officers were elected to serve for the year 1947-1948 at the recent Annual Meeting of the Idaho Public Health Association.

*President*—H. D. Cramer, M.D., Moscow

*1st Vice-President*—Clara S. Evans, Sandpoint

*2nd Vice-President*—A. R. McCabe, M.D., St. Maries

*3rd Vice-President*—A. M. Popma, M.D., Boise

*4th Vice-President*—Sister M. Alma Dolores, Boise

*5th Vice-President*—Mrs. C. S. Bosquet, Pocatello

*Secretary*—John W. Wright, Boise

*Treasurer*—Frances Goodwin, Boise

*Representative to A.P.H.A. Governing Council*—L. J. Peterson, Boise

#### NORTH DAKOTA PUBLIC HEALTH ASSOCIATION

The fourth annual meeting of the

North Dakota Public Health Association was held in Fargo in May. Among the items on the program was a panel discussion on "What are Our Public Health Liabilities and Assets," led by Carl E. Buck, Dr. P. H., Field Director of A.P.H.A.

The following officers were elected for the coming year:

*President*—A. L. Bayone

*Vice-President*—Everett Lobb

*Secretary*—Mrs Margaret Watts

*Treasurer*—Howard C Hammond

*Advisory Council Members* — Mrs. Jerome Evanson, Elvira Smith, Pat Steele, Jerome Svore, Caspar Walhowe, Gladys Wentland.

#### KANSAS PUBLIC HEALTH ASSOCIATION ELECTS NEW OFFICERS

At its Annual Meeting held May 27-28, the Kansas Public Health Association elected the following officers to serve for the next year:

*President*—Charles A Hunter, Ph.D., Topeka

*Vice-President*—Manila Robbins, Topeka

*President-Elect*—J. E. Wolfe, M.D., Wichita

*Secretary*—Evelyn Ford, Topeka

*Treasurer*—Arthur Wallach, Olathe

#### CONNECTICUT PUBLIC HEALTH ASSOCIATION

The Connecticut Public Health Association reports the following new officers elected at its Annual Meeting on May 27:

*President*—Thomas J. Bergin, M.D., Greenwich

*President-Elect*—George B. Davis, M.D., Milford

*Vice-President* — Sterling P. Taylor, M.D., North Haven

*Secretary-Treasurer*—Jessie P. Halbert, Meriden

#### COLORADO PUBLIC HEALTH ASSOCIATION

At the annual meeting of the Colorado Public Health Association at Colorado Springs in May, 1947, the following officers were elected for the coming year:

*President*: Alfred E. Kessler, Executive Secretary, Denver Tuberculosis Society

*Vice-President*: Robert Downs, D.D.S., Director of Dental Hygiene, Colorado State Health Department

*Secretary*: Norma Johannis, Director of Health Education, Colorado State Health Department

*Treasurer*: Mrs. Georgia Ball Travis, Director of Social Service, Colorado General Hospital

#### ILLINOIS PUBLIC HEALTH ASSOCIATION

The new officers elected at the recent Annual Meeting of the Illinois Public Health Association are as follows:

*President*—E. A. Piszczek, M.D., Chicago

*President-Elect* — Maude B. Carson, R.N., Springfield

*Secretary-Treasurer*—Harold M. Cavins, Ed.D., Charleston

#### SOCIAL HYGIENE LIFE MEMBERSHIP TO DR. CHESLEY

Dr. Albert J. Chesley, for more than a quarter of a century the Executive Officer of the Minnesota State Department of Health, has been awarded an honorary life membership in the American Social Hygiene Association. The *Journal* cannot hope to reprint all of the accomplishments listed in the citation accompanying this award which says among other things, "nobody could very well think of health in Minnesota's last forty years without Chesley there." However, the American Social Hygiene Association, (1790 Broadway, New York 19) has printed the citation in a leaflet whose cover page has a photograph of Dr. Chesley. They will be glad to send this to anyone requesting it while the supply lasts.

#### PUBLIC HEALTH NURSE ON STAFF OF HARVARD SCHOOL OF PUBLIC HEALTH

Frances M. Frazier, R.N., has been appointed Instructor in Public Health Nursing in the Department of Public Health Practice of the Harvard School of Public Health, beginning with the academic year 1947-1948. This represents the first appointment of a public health nurse to the staff of the school. Miss Frazier has just completed her

work for the M.P.H. degree in the Harvard School. During the war she served for nearly three years as nursing consultant to Yugoslavia under UNRRA.

#### DR. COURTNEY SMITH DIES IN AIRPLANE ACCIDENT

Courtney Smith, M.D., Dr. P. H., Medical Director, American National Red Cross, Washington, D. C., was among the 50 persons killed in the wreck of a Capitol Airliner on June 13 in the mountains of West Virginia.

Dr. Smith, a native of Michigan, was a graduate in medicine of the University of Oregon in 1933, with a Doctorate in Public Health from Yale in 1938. He had been a county health officer in Oregon, Assistant Health Officer in Portland, Oregon, and Assistant Commissioner of Health of the Territory of Alaska prior to his service in the war, which included a number of months in Germany. He was appointed Medical Director of the Red Cross recently when Dr. G. Foard McGinnes was made Vice-Chairman in charge of health services.

Dr. Smith joined the American Public Health Association in 1937 and was elected a Fellow of the Health Officers Section in 1941. He had served in many representative capacities, most recently as alternate delegate of the American Red Cross to the National Health Council.

#### TEN YEARS OF JANE COFFIN CHILDS CANCER FUND

Stanhope Bayne-Jones, M.D., Director, at a recent 10th Anniversary dinner meeting, reported that the Jane Coffin Childs Memorial Fund had expended nearly a million dollars in cancer research and had made total appropriations of \$1,343,000 through 1950. Annual appropriations have risen from \$10,000 in 1937 to \$171,000 in 1947.

Located at Yale University, the operation of the fund is not restricted to any single institution. From 40 to 60 per

cent of annual appropriations have been given to Yale. The present ratio is about 50 per cent.

#### NURSES IN PUBLIC HEALTH

The annual report of the U. S. Public Health Service on the number of nurses employed for public health work in the United States has recently been published. It shows 21,500 public health nurses employed on January 1, 1947, an increase of only 4 per cent over the previous year. However, the three previous years registered slight declines. Nearly three-fourths of all public health nurses reported were employed by local official health agencies or school boards. The complete analysis, made up of 14 statistical tables, is available from U. S. Public Health Service, Washington, D. C.

#### M.P.H. DEGREES TO HARVARD-M.I.T. SCHOOL OF PUBLIC HEALTH GRADUATES

At the Harvard University Commencement exercises in June, 43 living graduates of the former joint Harvard-Massachusetts Institute of Technology School of Public Health were awarded the degree of Master of Public Health. The school was in operation between 1913 and 1922, during which time those who have now received the Master's degree received the "Certificate in Public Health."

#### REPRINTS

Reprints of the article by Jessie M. Bierman, M.D., and Donald R. Caziarc of the California Department of Public Health, which appeared in the April issue of the *American Journal of Public Health* are available gratis in lots of five or ten copies to public health officers, school nurses, and administrators, parent-teachers study groups. Address Mrs. Mary Rogers Miller, 1209 Crenshaw Boulevard, Los Angeles 6, Calif.

# KANSAS ESTABLISHES A CANCER REGISTRY

The University of Kansas School of Medicine and Hospital, under the direction of the Division of Cancer Control of the State Board of Health, is establishing a cancer registry. Abstracts of about 800 cases of cancer for the year 1945 from the records of the department of pathology have been completed. Cancer records from the William Newton Memorial Hospital and St. Mary's Hospital at Winfield have also been received. This is one of the initial steps leading to the establishment of diagnostic cancer clinics as approved by the coöperative cancer control group in Kansas, the Kansas Medical Society, the Kansas Division of the American Cancer Society, and the Kansas State Board of Health.

# WEST VIRGINIA RAPID TREATMENT CENTER TRANSFERRED TO STATE HEALTH DEPARTMENT

The Kanawha Valley Medical Center, the state's rapid treatment center, South Charleston, was transferred April 1 from the federal government to the State Department of Health. The present staff of forty-five, including two doctors, is being retained. More than 10,000 persons were treated during the three years the center was operated by the government. Of these, more than one-fourth were under 21 years of age, 17.4 per cent between 18 and 21, and 1.3 per cent infants under 1 year of age. The cost per patient for the treatment of syphilis has been about \$46. After July 1 the state is expected to assume about 30 per cent of the cost of the center.

# TOMPKINS COUNTY (N. Y.) APPOINTS BOARD OF HEALTH

Tompkins County, with a population of nearly 50,000 and including the City of Ithaca, is the fourth New York county to organize under the provisions

of the 1947 amendment to the Public Health Law whereby a county health department receives state reimbursement for 75 per cent of the first \$100,000 spent for public health work, and 50 per cent of amounts in excess of \$100,000. The county supervisors recently appointed a county board of health and are recruiting a county health commissioner and other personnel.

# NEW CITY-COUNTY HEALTH DEPARTMENT IN ILLINOIS

Among the war emergency measures initiated in a number of Illinois communities was an arrangement whereby the medical health officer of the chief city in a county also supervised the health work of the rest of the county. Such an arrangement was in effect in Adams County where the Quincy Health Officer, Dr. O. H. Collins, gave general supervision to the health work in the county as well.

On April 1, 1947, in a referendum election, the citizens of Adams County voted the consolidation of the city and county health departments by a plurality larger than any received by candidates elected to office. The new County Board of Health will assume jurisdiction over the entire county population of more than 65,000 on March 31, 1948.

# GEORGE W. FULLER AWARD TO MAC H. MC CRADY

Mac H. McCrady, Chief, Division of Laboratories of the Ministry of Health, Province of Quebec, was selected as the recipient for the George W. Fuller Memorial Award by the Canadian Section of the American Water Works Association during their 27th annual meeting held in Montreal during April, 1947. The citation read:

For notable accomplishments in the water works field and in the affairs of this association especially in the interpretation of laboratory analyses, and in the development of "Standard Methods for Water Examination."

## WASHINGTON REPORT ON THE MEDICAL SCIENCES

On June 9 the weekly news letter, *Washington Report on the Medical Sciences*, began publication. Its aim is to report highlights of nationally significant developments in the week's news, to interpret, and to forecast now and then. Its editor is Gerald G. Gross, since 1930 science writer of the *Washington Post*, and currently consultant on public relations to the Surgeon General, U. S. Army. He was also special consultant for the recent medical survey report on the bituminous coal industry. (526 Bond Building, Washington, D. C. \$50 a year.)

## PUBLIC HEALTH OFFICERS HONORED

At a joint dinner of the Canadian Public Health Association and the State and Provincial Health Authorities of North America in Quebec May 22 certificates of honorary membership in the Canadian Association of Public Health were presented to Dr. Thomas Parran, Surgeon General of the U. S. Public Health Service, and to Dr. Walter L. Bierring, President of the State and Provincial Health Authorities of North America and Commissioner of Health of Iowa, both of whom addressed the group.

## YOUTH SERVICE NEWS

In December, 1946, the New York State Youth Commission (24 James Street, Albany) published vol. 1, no 1 of *Youth Service News* as an experiment in pooling knowledge and experience in the youth service field. It announced that frequency or even continuation of publication would depend on the need and whether the need is met in this way. Its announced intention of "no desire to publish for the sake of publishing," should prevent editorial hardening of the arteries. At any rate vol. 2 of *Youth Service News* came out in April, 1947.

## CORRECTION

DENNYS L. LYALL,<sup>†</sup> reported in June as health inspector of Salisbury Southern Rhodesia, Africa, was incorrectly reported as previously Assistant Director of Antitoxin, Serum, and Vaccine Laboratories, New York State Department of Health. HAROLD W. LYALL, PH.D.,\* holds the latter position and is still in Albany.

## PERSONALS

## Central States

AUGUST BAIER, M.D.,\* has been appointed Medical Director, United States Rubber Company, Detroit, Mich. Dr. Baier was formerly Medical Director, Solar Aircraft Co., Des Moines, Ia.

F. C. BEELMAN, M.D.,\* Secretary and Executive Officer of the Kansas State Board of Health, was elected president of the Conference of State and Provincial Health Authorities of North America, at the 1947 session held May 20 and 21 at Quebec, Canada.

RICHARD G. BOND,<sup>†</sup> formerly Assistant Engineer, State Department of Health, Des Moines, Ia., has been appointed Assistant Professor, School of Civil Engineering, Cornell University, Ithaca, N. Y.

SETH L. COX, M.D.,<sup>†</sup> formerly Medical Director of the Kansas Tuberculosis and Health Association, has been appointed Executive Secretary, succeeding C. H. LERRIGO, M.D.,\* who becomes Executive Secretary Emeritus.

JOSEPH E. FLANAGAN, JR.,<sup>†</sup> formerly Industrial Hygiene Engineer, Ohio State Health Department, has been appointed Industrial Hygiene Consultant, District No. 3, U. S. Public Health Service, Chicago, Ill.

ROLLA N. HARGER, PH.D., Professor of Biochemistry and Toxicology in the Indiana University School of Medi-

## NEWS FROM THE FIELD

Vol. 37

cine, Bloomington-Indianapolis, has joined the staff of the Indiana Bureau of Industrial Hygiene as consultant on toxicology.

R. M. HEILMAN, M.D.,† has returned to service with the Kansas State Board of Health, as Director of the newly created Division of Hospital Survey and Construction. Dr. Heilman was formerly Director of the state health department's Industrial Hygiene Division, having been appointed to that Division when it was established. For the last several months he has been practising internal medicine at Winter Veteran's Hospital.

ROSCOE L. SENSENICH, M.D., practising physician of South Bend, Ind., was made Presiding President-elect of the American Medical Association for 1947-48 at the Centennial Meeting of the Association in Atlantic City in June.

ALFRED H. WIETERS,\* formerly Director of the Division of Public Health Engineering of the Iowa State Department of Health, has become a sanitary engineer with the U.S.P. H.S., assigned to the hospital construction program.

ALEXANDER WITKOW, M.D.,\* formerly city-county health commissioner of Delaware, Ohio, has been appointed director of the Bureau of County Health Work in the West Virginia State Department of Health, to succeed NORMAN G. ANGSTADT, M.D.,† resigned.

## Eastern States

CONRAD BERENS, M.D., of New York City, was elected vice-president of the National Society for the Prevention of Blindness at the June meeting of the Board of Directors. Dr. Berens is Director of the Graduate Course

of the Department of Ophthalmology, New York University, and Executive Surgeon of the New York Eye and Ear Infirmary and Affiliated Institutions.

CHESTER S. BOWERS,\* acting director since March 1, 1946, was appointed Director, Bureau of Public Health Information, Connecticut State Department of Health, effective April 1, 1947.

JOHN E. GORDON, M.D.,\* Professor of Preventive Medicine and Epidemiology, Harvard University, Boston, Mass., was recently awarded the Liberty Cross by His Majesty the King of Norway, in recognition of services to Norway during World War II.

EDWARD S. HOPKINS,† Associate Engineer of the Baltimore Department of Public Works, has been appointed Chairman of the Committee on Standard Methods for the Examination of Water and Sewage of the American Chemical Society.

HELEN E. KINNEY,† former Instructor, Public Health Nursing Department, Seton Hall College, Newark, N. J., has been appointed Assistant Director, Division of Public Health Nursing, St. Louis University, St. Louis, Mo.

HENRIETTA LANDAU, R.N.,\* has been appointed Assistant Professor of Nursing Education at New York University's School of Education. She was formerly consultant public health nurse with the U. S. Public Health Service.

HUGH R. LEAVELL, M.D.,\* was elected President of the Massachusetts Central Health Council on May 1.

ROMAYNE W. LILOIA,† formerly Supervisor, Visiting Nurse Association, Scranton, Pa., has been appointed Consulting Public Health Nurse, Division of Local Health Administration, North Carolina State Board of Health.

\* Fellow, A.P.H.A.

† Member, A.P.H.A.

HAROLD P. LYON, M.D., former Director of Medical Services, Sanitation, and Preventive Medicine Division, Royal Canadian Air Force, has been appointed Industrial Physician and Medical Director to "Hartford Group," Small Industrial Plants, in Hartford, Conn.

#### NEW APPOINTMENTS TO THE MASSACHUSETTS DEPARTMENT OF HEALTH:

WILLIAM D. WELLOCK, D.M.D., a Navy veteran and recent graduate of the Harvard School of Public Health, as Director of the Division of Dental Health.

GRACE E. LUTMAN, M.D., Dr.P.H.,† former assistant state district health officer, New York State Department of Health, as Supervisor of Clinics for Crippled Children.

FRANCIS W. HOOPER, M.D., as district health officer of the South Metropolitan district with headquarters in Quincy. Prior to his appointment, Dr. Hooper saw 18 months' service in the European Theatre of Operations as a captain in the Medical Corps, AUS.

CLAUDE W. MUNGER † was recently appointed a member of the hospital advisory committee of Associated Hospital Service—New York's Blue Cross Plan. Dr. Munger is director of St. Lukes Hospital and professor of hospital administration at Columbia University.

#### CHANGES IN NEW YORK STATE DEPARTMENT OF HEALTH:

Assistant District Health Officers appointed. WILLIAM R. DONOVAN, M.D., Geneva; FRANK R. FRECKLETON, M.D.,‡ Utica; MICHAEL LIAPAL, M.D.,‡ Middletown; CLAYTON M. STEWARD, M.D.,‡ Binghampton; VINCENT H. HANDY, M.D.,‡ Buffalo.

JOHN M. CHAPMAN, M.D.,‡ district health officer in the Saranac Lake

District, resigned from the department to become Assistant Director of the Medical Section of the Health Department of the City of Los Angeles, Calif.

DON M. GRISWOLD, M.D.,\* district health officer in the Geneva district, retired effective May 31.

RAY E. TRUSSELL, M.D.,‡ was appointed Epidemiologist in the Division of Communicable Diseases.

H. C. MILES, M.D.,‡ and W. C. SPRING, JR., M.D.,‡ formerly apprentice epidemiologists on the staff of the State Department, were appointed deputy commissioners of health of Cattaraugus and Rensselaer County Health Departments, respectively.

JULIA MACPHILLIPS, consultant public health nurse in social hygiene work, retired from State service after serving 27 years in the department.

HOWARD A. RUSK, M.D.,‡ Chairman of the Department of Rehabilitation and Physical Medicine of New York University, New York, N. Y., and Associate Editor of *The New York Times*, was recently awarded the degree of Doctor of Science by the University of Missouri.

CHARLES C. SPENCER, C.E., has been appointed Assistant Professor of Sanitary Science, School of Public Health, Columbia University, effective July 1, 1947. Major Spencer's recent experience includes sanitary and public health engineering assignments with the Dorr Company in the United States and Europe, the U. S. Public Health Service in the United States and Central America, and the Sanitary Corps, U. S. Army, in the United States and Brazil. His appointment is coupled with an enlarged curriculum in the regular program of gradu-

\* Fellow, A.P.H.A.

† Member, A.P.H.A.

ate engineering training for public health engineers which has been offered since 1921 by the School of Public Health.

MAJOR GENERAL MORRISON C. STAYER,\* U. S. Army, Retired, at present chief of the Bureau of Tuberculosis Control, Pennsylvania State Department of Health, was decorated with the Legion of Merit at Carlisle Barracks, Pa., in April, 1947. The citation refers to General Stayer's control of typhus, typhoid fever, and other epidemics in the American Zone of occupied Germany.

HELEN E. WATKINS† has resigned as Director of Recruiting, Training and Placement of Personnel of the New York State Charities Aid Committee on Tuberculosis and Public Health to become Executive Secretary of the Arizona Anti-Tuberculosis Association with headquarters in Phoenix.

#### Southern States

MAJOR GENERAL RAYMOND W. BLISS,

on June 1 became the new Surgeon General of the Army, succeeding

MAJOR GENERAL NORMAN T. KIRK who will retire from active duty.

Since January 1, 1946, General Bliss has served as Deputy Surgeon General.

BRIG. GENERAL GEORGE E. ARMSTRONG assumes the duties of

Deputy Surgeon General.

RUTH BUNKER, R.N., on July 1 joined

the West Virginia State Department of Health as consultant nurse in

tuberculosis. Before joining the armed forces she was a public health

nurse in Braxton County and with the Fayette County Tuberculosis Association.

CARL M. GAMBILL, M.D.,† formerly

Director of Local Health Work in the Kentucky State Health Department,

is now Associate Editor, Division of Publications, Mayo Clinic, Rochester, Minn.

JOHN M. HOOPER, M.D., M.P.H.,\* has

resigned from his position as Director, Amarillo Health Department, Amarillo, Texas, to go into private practice.

GRACE I. LARSEN, R.N.,† has been ap-

pointed Supervising Nurse, U. S. Pub-

lic Health Service at Weld County

Health Department, Greeley, Colo.

Miss Larsen was formerly assigned

Supervising Nurse, Marion County

Health Department, West Virginia.

NELL MCKEEVER† has been appointed

Health Education Consultant, Office

of Health Education, U. S. Public

Health Service, Brookline, Mass.

Miss McKeever was formerly Health

Educator of the City-County Health

Department, Muskogee, Okla.

WILLIAM GREGORY MORGAN, M.D.,†

former Health Officer, Clark-Mont-

gomery Co., Kentucky, has been ap-

pointed Medical Director of the

General Electric Co., Owensboro, Ky.

JAMES A. MORROW† has been appointed

Office Manager, E. L. Miller Welding

Contractor, West Chester, Pa. He

was formerly Assistant Sanitarian,

U. S.P.H.S., City Health Department,

Charlotte, N. C.

MORRIS A. NUSSBAUM† has been ap-

pointed Sanitary Chemist, Kingston

City Laboratory, Kingston, N. Y.

He was formerly Chemist, U.S.P.H.S.,

State Hygiene Laboratory, Jackson,

Miss.

MARION L. SHADDIX, M.D.,† has been

appointed Chief Medical Officer,

Veterans Administration, Medical

Unit, Gadsden, Alabama. Dr. Shad-

dix was formerly Health Officer, Clay

and Randolph Counties.

JAMES H. STEELE† has been appointed

head of the Veterinary Public Health

Section which has been established

in the States Relations Division of the

U. S. Public Health Service. This

section will conduct demonstration

projects on the control of animal dis-

eases communicable to man and will

collect epidemiological data - perti-

nent to these diseases.



## Western States

ANSTA BARR, M.S.,† has been appointed Nutrition Consultant, U. S. Children's Bureau, Federal Security Agency, Dallas, Texas. She was formerly Nutrition Consultant for the Arizona State Health Department.

ARVE H. DAHL† is Chief, Mosquito Control Section, California State Department of Public Health, Berkeley.

J. C. GEIGER, M.D.,\* Director of Public Health, San Francisco, Calif., has been honored by Her Gracious and Royal Majesty, The Queen of Holland, with the Royal Order of the Crown of Orange Nassau, Officer grade. It was accompanied by the following citation: "For distinguished services to the Crown and nation during World War II and for remarkable insight and understanding of public health."

AUDREY IMMEL,† Acting State Registrar, has resigned her position in the Vital Statistics Section, Oregon State Board of Health, to accept appointment to the staff of the New Mexico Department of Health with headquarters in Santa Fe.

ELLARENE L. MACCOY, M.D.,† formerly district medical officer of the Los Angeles area for the Bureau of Maternal and Child Health, has resigned after serving the Department of Public Health for over 11 years, to accept a teaching position with the University of California at Los Angeles.

ROBERT J. OWENS,† formerly Director, Division of Industrial Hygiene, Colorado State Department of Health, has been appointed Chief, Health and Safety Section, Veterans Administration, Branch 13, Denver, Colo.

GEORGE W. STILES, M.D.,† Bacteriologist in Charge, Branch Pathological Laboratory, Bureau of Animal In-

dustry, U. S. Department of Agriculture, Denver, Colo., who has served many years with the U. S. Department of Agriculture in various capacities retired on July 31, to devote himself to consulting services.

## South America

SÉRVULO LIMA, M.D.,† Public Health physician of the National Department of Health of the Ministry of Education and Health of Brazil and Superintendent of the Servico Especial de Saúde Pública was granted retirement by the President of the Republic, through a recent decree. He will continue his service with the Servico Especial de Saúde Pública, where, surrounded by the well-merited confidence of the Ministry of Education and Health, The Institute of Inter-American Affairs and all his colleagues, he will continue to work with this program outlined in the Good Neighbor Policy for the health of the Americas.

## Deaths

EDWARD R. BALDWIN, M.D., one of the few remaining pioneers in the fight against tuberculosis who shared in the work of EDWARD LIVINGSTON TRUDEAU, M.D., died at the age of 82 at Saranac Lake on May 6. Dr. Baldwin went to Saranac Lake in 1892 as a tuberculosis patient and remained as a close associate of Dr. Trudeau and director of the Saranac Lake Laboratory for the Study of Tuberculosis. He was one of the founders of the Trudeau Sanitarium, was president of the National Tuberculosis Association in 1915 and 1916, and was awarded the Trudeau Medal in 1927.

FRED WELDEN CAUDILL, M.D., Epidemiologist of the Kentucky State Health Department, died in Louisville on January 12, 1947 at the age of 47.

\* D. T. A. P. H. A.  
† D. T. A. P. H. A.

# American Journal of Public Health

## and THE NATION'S HEALTH

---

Volume 37

September, 1947

Number 9

### An Evaluation of the Use of BCG in the Prevention of Tuberculosis in Infants and Children\*

MILTON I. LEVINE, M.D., F.A.P.H.A.

*Consultant Pediatrician, Bureau of Child Hygiene, Department of Health, New York, N. Y.*

OF the many attempts at vaccination or inoculation against tuberculosis, none has been more widely used or more publicized than the use of BCG vaccine.

This vaccine is a living attenuated strain of an originally virulent bovine tubercle bacillus. So marked was its attenuation after a series of cultivations on a glycerol potato bile medium, that it no longer was capable of producing progressive tuberculosis in guinea pigs, rabbits, or calves, and, although over 5,000,000 children have been inoculated with it since 1922, there is no authentic case on record of the organism having returned to its former virulence.

There is also undeniable proof that BCG vaccine as well as heat killed

tubercle bacilli produce definite protection against tuberculosis in experimental animals.

However, it has been demonstrated on numerous occasions that the fact that experimental animals receive protection from vaccines, inoculations, or drugs, does not necessarily signify that human beings will receive the same protection.

It is therefore of the greatest importance that carefully controlled studies on human beings be reported before the use of BCG vaccine is accepted as of proven value as a public health measure in the prevention of tuberculosis.

In 1926 a culture of BCG was brought to the United States by the late Dr. William H. Park of the New York City Department of Health, and in the same year the studies on immunization of children were initiated in New York City.

On the basis of this study a great deal was learned and as a result of this the following standards were set down as

\* Presented before the Maternal and Child Health Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 12, 1946.

From the New York Hospital and the Department of Pediatrics, Cornell University Medical College. Aided by a grant from Mead Johnson & Company, Evansville, Indiana.

necessary for a scientific conclusion:

*Essential Factors in Study of BCG  
Immunization*

1. Vaccine must be of standard strength.
2. There must be controls.
3. Controls and vaccinated cases should:
  - a. Be selected by alternation to eliminate possibility of bias.
  - b. Have identical follow-up.
  - c. Come from same locality.
  - d. Come from similar age group.
  - e. Come from similar racial group.
4. Contact with cases must be maintained.
5. Exposure conditions of cases must be known throughout study period.
6. A reliable diagnosis at death.

Throughout the years, numerous studies have been reported on the value of BCG inoculation, and the great majority of these reports have been favorable. However, with few exceptions all of these studies were inadequately controlled and very few of the factors mentioned above were considered.

In some studies the mortality rate from tuberculosis of the general population was compared with that of the vaccinated group; in others a different age group served as a control; in some the tuberculosis mortality of vaccinated children was compared with the tuberculosis mortality of previous years; in other studies the controls comprised cases where vaccination was refused; in still others the control group was less carefully followed than the vaccinated cases; in one study, only the vaccinated cases were temporarily separated from the tuberculous source.

Recently a paper has been published concerning the results of BCG vaccination in Scandinavia.<sup>6</sup> In all of the countries reported the results have been favorable, but again the method of control selection is open to criticism. In Oslo and in Bergen, Norway, the tuberculosis mortality of the vaccinated group was compared with that of the general population. In Stockholm, Sweden, where excellent results were re-

ported by Wallgren no controls were used. In answer to objections that no adequate controls were used, Wallgren stated that parents very seldom refuse to consent to BCG vaccination. The studies in Norrbotten, Orebro, and Boraas, all in Sweden, were also controlled by the general population. The vaccination has also been used extensively in Denmark, but controls are almost entirely lacking.

However, in spite of inadequate controls, and the knowledge that results at the present time cannot be considered as conclusive, one cannot overlook the fact that practically all of these reports have been uniformly favorable. Notable exceptions are the studies from New York City<sup>1</sup> and those of Blanch, Blanch, and Liertier of Uruguay.<sup>2</sup>

The latter authors have vaccinated over 103,000 infants in Uruguay since 1930 by oral, subcutaneous, intracutaneous, and multiple puncture methods. The tuberculosis mortality among the vaccinated infants was 7 per cent as against a tuberculosis mortality of 5.2 per cent of the controls.

At the start of the work in New York City, an attempt was made to control the study by dividing the accepted children into two equal groups: those for vaccination and those to serve as controls. Under this system a physician was assigned a number of cases and told to vaccinate one-half of the group. Subsequent experience has proved that by this method of selection the general tendency was to inoculate the children of the more coöperative parents and keep the children of non-coöperative parents as controls. The effect of this error will be readily realized with the knowledge that the more coöperative parent usually brings the child to the clinic more often and follows the physician's instructions more carefully.

The arbitrary division of cases was followed from 1927 until January 1, 1933, during which time 990 children

were studied, of which 445 were vaccinated.

The results at the end of this period are shown in Table 1.

TABLE 1

*Results January 1, 1933—Prior to Institution of Alternate Selection*

	Cases	Tuberculosis Deaths	
		Number	Per cent
Vaccinated	445	3	0.68
Controls	545	18	3.38

The figures as of that date showed the tuberculosis mortality of the controls to be almost five times that of the vaccinated cases.

The method of selection was changed on January 1, 1933, so that alternate children were routinely vaccinated. The selection was made at headquarters as soon as the names were received and before they were assigned to staff pediatricians.

It is interesting to note the tuberculosis mortality in the two groups before and after this alternation was instituted (Table 2).

TABLE 2

*Comparative Results Before and After Alternate Selection*

	Cases	Tuberculosis Deaths	
		Number	Per cent
Total Cases			
BCG vaccinated	1,011	11	1.08
Controls	1,073	26	2.42
Cases 12/15/26-1/1/33 (before alternate selection)			
BCG vaccinated	445	3	0.68
Controls	545	18	3.38
Cases 1/1/33-1/1/44 (after alternate selection)			
BCG vaccinated	566	8	1.41
Controls	528	8	1.51

In the second period (January 1, 1933, to January 1, 1944) after the institution of alternate selection, the tuberculosis mortality figures were essentially the same for both the vaccinated cases and the controls.

Studies on the variables which might have been responsible for the change in comparative tuberculosis mortality brought out that the coöperation of the

vaccinated group was appreciably greater than that of the control group prior to the period of alternation, with considerably closer approximation in the latter period.<sup>1</sup>

Other variables such as exposure, racial distribution, and economic conditions appeared to have no influence on the change. However, since the tuberculosis mortality of the vaccinated cases increased after January 1, 1933, the question arose as to whether there was any loss in activity of the BCG vaccine. A history of the BCG vaccine used in the New York study revealed the following:

The original BCG culture was obtained by Dr. William H. Park from Calmette in 1926. Strains of this culture were sent to the Mt. McGregor Sanatorium and to the Phipps Institute. This culture was used in the preparation of the vaccine until late in 1932 when it became contaminated by molds. Pure cultures were at last obtained by the antiformin method and plated on media containing aniline dyes (Loewen-

stein's and modified Petroff medium). Meanwhile, subcultures were obtained from the Phipps Institute. The cultures were used alternately for vaccine for a period of one year. After this time both cultures were used without selection. Virulence tests were made at 3 month intervals but no tests were made for potency. However, it is to be noted that the percentage of positive tubercu-

lin reactions resulting from BCG inoculations did not decrease after January 1, 1933, there being 87.1 per cent before as against 87.6 per cent after that date, but this does not rule out the possibility of a loss in potency of the cultures after the contamination.

However, it was found that in a limited number of cases where separation for 3 months before and 3 months after vaccination was possible, there was some indication that BCG inoculation might have protective value were such separation practical (Table 3).

TABLE 3

*Exposed Cases Separated 3 Months before and 3 Months after Being Vaccinated or Taken Up*

	Cases	Tuberculosis Deaths	
		Number	Per cent
Vaccinated	91	1 *	1.1
Controls	96	3 †	3.1

\* This child was born of a mother dying of tuberculosis; was never exposed; died at 3 months of age.

† One case with no known exposure died of tuberculosis at 15 months of age.

In New York City the routine separation of children for 3 months before and 3 months after BCG vaccination to eliminate the hazards of contiguous contamination with human tubercle bacilli was not found to be a feasible or safe procedure.<sup>1</sup>

It was therefore concluded that, as a public health measure in New York

City the routine vaccination with BCG of children from tuberculous homes was less advantageous than removal of the tuberculous subjects from the home. It is realized, of course, that a city such as New York with adequate beds for the hospitalization of tuberculous patients presents a situation entirely dissimilar from localities with lack of necessary diagnostic and hospital facilities.

Within recent months the greatest amount of attention in this country has been focused on two particular reports on the efficacy of BCG: The report on Experience with BCG Vaccine in the Control of Tuberculosis Among North American Indians, by Aronson and Palmer,<sup>2</sup> and the study on BCG of the Tice Institute in Chicago by Rosenthal.<sup>3</sup>

It is of interest to appraise these studies in the light of the standards developed as a result of the investigation in New York City.

The studies on Indians were undertaken at eight different reservations in western United States and in Alaska. Approximately equal numbers of Indians were selected for vaccination and controls (Table 4).

It is stated that "a random portion of the tuberculin-negative reactors was vaccinated . . . while the remainder served as controls." Apparently the cases were not alternated and in writing of the method of selection the authors

TABLE 4

*Results of BCG Studies on Indian Reservations*

	Vaccinated Cases	Tuberculosis Deaths	Controls	Tuberculosis Deaths
<i>Arizona</i>				
Pima A	259	1	263	2
Pima B	95	0	86	2
<i>Wyoming</i>				
Shoshone	110	0	85	1
Arapaho	118	1	106	4
<i>North Dakota</i>				
Chippewa	179	0	162	0
Misty Mountain	41	0	25	1
<i>South Dakota</i>				
Poncha	269	2	266	6
<i>Alaska</i>	497	0	464	12

state, "it is, of course, not possible to be certain that no bias was unintentionally introduced." The vaccinated and control cases balance only fairly well as to age, per cent examined annually, and degree of exposure to tuberculosis. But the studies in New York would seem to indicate that this alone is insufficient and that the impartial selection of cases by alternation is an essential factor in adequate experimentation. It is also necessary to point out the arbitrary ratings of exposure given contact cases in the paper of Aronson and Palmer. For instance, to quote: "The highest rating 3 was limited 'to very intimate contact with a sputum-positive case.'" There is no consideration given, apparently, to whether the case was Gafky I or Gafky X as long as organisms were found in the sputum.

The question of accurate diagnosis at death also must be considered in the review of the study on American Indians. The basis for the diagnosis of the tuberculosis deaths is inadequate when it is reported that "in the control group some of the deaths which were assigned to non-tuberculous causes may actually have been a consequence of tuberculosis." The New York study shows clearly the necessity of an autopsy before a diagnosis of a tuberculous death can be considered entirely accurate.<sup>4</sup>

However, the results of BCG vaccination on the American Indian are reported as favorable and must at least be considered as additional evidence that BCG vaccine has a degree of effectiveness in the prevention of tuberculosis.

The report of ten years' experience with BCG in the City of Chicago also presents favorable results. In this study the cases were alternated without selection, the children were grouped into two general categories; those with no known exposures to tuberculosis (non-contact cases), and those from tuberculous households (contact cases).

The results of the non-contact cases are reported in Table 5.

TABLE 5  
*Tuberculosis Mortality of Non-Contact Cases (Chicago Study)*

	Number of Cases	Tuberculosis Deaths	Tuberculosis Mortality
Vaccinated	1,204	1	0.08%
Controls	1,213	4	0.33%

It is interesting to note that among these "non-contact" controls the tuberculin tests were positive in 9 per cent at the age of 2 years; 15 per cent at the age of 3 years, and 35 per cent at the age of 5 years. This high morbidity is explained by the fact that the children came largely from a district in Chicago where the tuberculosis mortality ranged as high as 330 per 100,000.

The children who came from tuberculous homes were separated for varying periods of time in foster homes before and after vaccination or for a similar time in the case of controls. Rosenthal states that "BCG should not be expected to accomplish more than other forms of vaccination where protection is afforded against a casual contact with the respective disease, and where isolation is strictly enforced."

The results of contact cases in the Chicago study are shown in Table 6.

TABLE 6  
*Tuberculosis Mortality of Contact Cases (Chicago Study)*

	Number of Cases	Tuberculosis Deaths	Tuberculosis Mortality
Vaccinated	98	0	0%
Controls	63	3	4.53%

In April, 1946, it was my privilege to visit the Tice Institute in Chicago to become more fully acquainted with the methods used and the results obtained. In this study the method of alternate selection was used, vaccinated cases were separated from contacts before and after inoculation, and controls separated for a similar period of time.

However, several serious factors deserve consideration. Over 300 children

have been lost in the course of the study, and in view of the low tuberculosis mortality rate such a loss cannot be ignored. A more extensive follow-up of exposure to tuberculosis after the children return from the foster homes would also be advisable.

Rosenthal<sup>3</sup> states: "These infants were not returned to the source case, but were kept in a permanent foster home. Fortunately, the State of Illinois forbids a child under 16 years of age to live with a tuberculous member who has a "positive sputum." However, inquiries reveal that separation is not strictly enforced and that the tuberculous member of the family may legally sleep in an apartment next door or around the corner but return to his own home during the day.

In the Chicago study, therefore, the exposure to tuberculosis is frequently unknown once the children return from the foster homes.

No information is given in the Chicago study as to the racial percentages in each group, although of the 10 tuberculosis deaths as of April, 1946, 7 were of Negro children. But here again the results are definitely favorable and contribute added evidence as to the probable efficacy of the vaccine.

In the final analysis, the efficacy of BCG vaccine must be determined on the basis of tuberculosis mortality or at least on its ability to prevent the caseous-pneumonic type of pulmonary lesion. The fact that children or nurses vaccinated with BCG show less frequently evidence of pulmonary tuberculous lesions on roentgenographic examination is in itself inadequate and almost valueless evidence.

The first tubercle bacilli inhaled into the lungs produce an area of inflammation about the focal site. This appears as a shadow on chest roentgenograms and is part of the primary complex of tuberculosis, the reaction to the first infection with the tubercle bacillus. Co-

incident with this the tissues become allergic, and when this area of inflammation subsides, no other inhaled tubercle bacilli are capable of producing again such an area of inflammation. The tissue reaction has been changed by the development of allergy.

When one inoculates the arm or the leg with BCG vaccine a focal reaction occurs, the lymph nodes draining the area enlarge and the tissues become allergic to tuberculin. In other words, the vaccination produces a primary complex in the arm or leg, and one would not expect the typical primary pulmonary infiltration on later exposure to tubercle bacilli. Yet this fact is overlooked completely in many reports which stress the lack of x-ray evidence of pulmonary inflammation after inoculation with BCG. A number of these reports are based on studies of persons entering nursing training schools where certain of the negative reactors to tuberculin testing were vaccinated with BCG. The reports on the American Indians as well as the Chicago study claim effectiveness for the vaccine in the lessened morbidity of the vaccinated cases as evidenced by pulmonary roentgenographic findings.

Despite the fact that up to the present time no study on the effectiveness of BCG fulfils all the essential research qualifications, there appears to be considerable circumstantial evidence in its favor. This makes the continuance of BCG research essential. New studies should be undertaken in districts where tuberculosis mortality is high. These new studies and those already in progress should be checked by some central regulating organization which should be responsible for standardizing the vaccine, correlating methods of investigation, and checking the results statistically. Cases should be alternated. Certain controlled studies which were undertaken and discontinued should be taken up again and as many cases con-

tacted as possible in order to follow the children through adolescence. Such studies would include the New York investigation where most of the children are already entering or are in adolescence.

There is still a great deal to be learned about the BCG vaccine.

If the BCG vaccine is effective, what degree of immunity does it confer? Judging from the results of favorable reports one would conclude that the immunity is not complete as with smallpox, diphtheria, or typhoid inoculations. Although a degree of immunity is indicated, a certain number of tuberculosis deaths may still be expected among vaccinated individuals.

Does the effectiveness last only during the period of tuberculin allergy following inoculation ( $1\frac{1}{2}$  to 2 years on the average) as suggested by some authors, or does immunity remain after the loss

of tuberculin allergy, an opinion held by others?

Is separation from a tuberculous source necessary before and after vaccination as claimed by Rosenthal and suggested by the results of the New York study, and if so, can adequate, well controlled foster homes be found?

Why is it that various workers report marked differences in the development of positive tuberculin reactions after vaccination with BCG?

Table 7 summarizes the degree of tuberculin reactivity found in certain studies.

From a public health point of view which would be more efficacious in the eradication of tuberculosis—vaccination with BCG or the separation and hospitalization of all positive sputum cases?

There are so many variables which influence the course of tuberculosis and cause a shift in statistical reports, that

TABLE 7

<i>Author</i>	<i>Type of Vaccination Used</i>	<i>Tuberculin Test Used</i>	<i>Per cent Positive Tuberculin Reactors</i>	<i>Group Vaccinated</i>
Aronson <sup>2</sup>	Intradermal 0.1 mg.	PPD	56 1 yr. after vac.	American Indians
Overton <sup>6</sup>	" 0.15 mg.	Dilute tuberculin	100	School children, Nashville, Tenn.
Lewine <sup>5</sup>	" 0.15 mg.	"	87.6	Infants under 1 yr. of age, New York City
Rosenthal <sup>4</sup>	Multiple puncture	Tuberculin patch test	99.57	Infants and children, Chicago
Azeite <sup>7</sup>	Intradermal 0.1 mg.	Dilute tuberculin	77.78	People of all ages, Brazil
"	Oral 3 doses BCG of 20 to 30 mg. each	"	87.72	New-born infants, Brazil
Hrimbeck <sup>8</sup>	Intradermal	Dilute tuberculin	73	394 nurses, Norway
Wallgren <sup>8</sup>	"	"	97.1	Infants and children, Sweden
Gore and Kilbuck <sup>10</sup>	Multiple puncture	"	97 1 month after vac. 70 1 yr. after vac.	Children and adolescents, Uruguay



renewed and additional research is still necessary before the vaccine can be considered completely efficacious, and be fully accepted as a public health measure.

Is this discrepancy in findings due to the amount and potency of the vaccine used, the method of vaccination, the manner of tuberculin testing, differences in racial groups tested, or the opportunities for contact with human tubercle bacilli?

Further knowledge is also needed concerning the effectiveness of the vaccine in different racial groups, with different degrees of resistance.

Further knowledge is also necessary concerning the stability of potency of the vaccine, and the effectiveness of the vaccine when prepared with different culture media.

It is an accepted fact that although the vaccine has never been known to return to virulence, it does vary in potency, a fact emphasized by Holm.<sup>9</sup> Means for establishing and fixing the potency should be undertaken.

#### SUMMARY

1. On the basis of over 5 000 000 inoculations of human beings with BCG vaccine, it can be definitely stated that the vaccine is entirely safe.

2. Numerous favorable reports on the efficacy of BCG vaccine in the prevention of tuberculosis have been published. With very few exceptions these studies have been inadequately controlled.

3. In spite of the fact that results to date are scientifically inconclusive, the consistency of favorable reports would seem to indicate that the vaccine has a certain degree of efficacy.

4. The continuance of BCG research is most essential to determine the degree of its effectiveness.

5. Further knowledge is also needed concerning the duration of immunity; the necessity for re-inoculations; the significance of the tuberculin reaction following BCG vaccination; the efficacy of the vaccine in different racial groups; and the potency and efficacy of the vaccine when prepared with different culture media.

6. Renewed and additional research is still necessary before the vaccine can be considered completely efficacious, and be fully accepted as a general public health measure.

#### REFERENCES

1. Levine, M. I., and Sackett, M. Results of BCG Immunization in New York City. *Am. Rev. Tuberc.*, 53:517, 1946.
2. Blanch, P., Blanch, H., and Lieutier, H. Posición de la vacuna BCG en la profilaxis de la tuberculosis. *Rev. de tuberc. d. Uruguay*, 13:1, 1945.
3. Aronson, J. D., and Palmer, C. E.: Experience with BCG Vaccine in the Control of Tuberculosis Among North American Indians, *Extr. Pub. Health Rep.*, 61:802, 1946.
4. Rosenthal, S. R., Bland, and Leslie. Ten Years' Experience with BCG. *J. Pediat.*, 26:470, 1945.
5. Levine, M. I., Vogel, P., and Rosenberg, H. A. Immunization Against Tuberculosis. *Am. Rev. Tuberc.*, 38:632, 1938.
6. Overton, H. Report on BCG Vaccination in Nashville, Tenn. *Vaccination Préventive de la Tuberculose. Rap. et Documents Institut Pasteur, Paris*, 1932.
7. Bueno, M. M. The Control of Tuberculosis in Brazil. *Am. Rev. Tuberc.*, 55:250, 1947.
8. Birkhang, K. BCG Vaccination in Scandinavia. *Am. Rev. Tuberc.*, 55:244, 1947.
9. Holm, J. BCG Vaccination in Denmark. *Pub. Health Rep.*, 61:1298, 1946.
10. Gines, A. R., and Richieri, V. R. Posición de la vacuna BCG en la profilaxis de la tuberculosis. *Rev. de tuberc. d. Uruguay*, 13:255, 1945.

# Experience and Lessons from Emergency Maternity and Infant Care\*

NATHAN SINAI, DR.P.H., F.A.P.H.A.

*Professor of Public Health and Director, Bureau of Public Health Economics,  
University of Michigan, Ann Arbor, Mich.*

RARELY is it possible to point to any single impulse that motivated a broad public health movement. But in 1942 there came out of Fort Lewis, Washington, a plea for help. Peacetime facilities for maternity care were strained beyond their capacity to serve the needs and demands of the wives of members of the armed forces. Logically, the plea was transmitted to the national agency most directly concerned with maternity health, the Children's Bureau. Thus began the movement that resulted in EMIC—Emergency Maternity and Infant Care.

Looking backward from the vantage point of 1946, the evidence is clear that for this problem of the war there was as little preparation as for the many others. Yet, without the drama that attended the solutions of many other problems, the accomplishments in meeting this one stand as a permanent monument to the combined efforts of medicine and public health. Maternity and infant care were the objectives, and maternity and infant care are the accomplishments. The record of almost a million completed maternity cases and over one hundred thousand completed infant cases portrays in cold statistics the

enormous activity of EMIC. EMIC began as a minor effort; it grew to such proportions that it became the chief preoccupation of the Children's Bureau and the maternal and child health divisions in the states and territories. And all this was compressed within the limits of about three years. "Emergency" is a mild word to describe the atmosphere and the driving pressure that attended the expansion of maternity and infant care.

When the movement that later became EMIC started in 1942, certain funds already appropriated under Title V of the Social Security Act were used. These were the maternal and child health funds that could be granted to the states on a basis of need, and without matching the so-called "B" funds. Subsequent developments showed the hopelessness of any assumption that the expenditure in this manner of the total "B" funds, amounting to less than two million dollars, would make even an impression on the problem. As the armed forces increased in numbers, so did this problem assume increasing proportions.

Not until March 18, 1943, did Congress approve the first appropriation for EMIC. It amounted to \$1,200,000. In July an additional \$4,400,000 was approved, and in October the sum granted was \$18,600,000. Thus in the first year of its existence EMIC faced the huge task of expending appropriations involving more than 25 million dollars. On June 28, 1944, Congress approved

\* Presented at a Joint Session of the Maternal and Child Health, and the School Health Sections of the American Public Health Association at the Seventy-first Annual Meeting in Cleveland, Ohio, November 12, 1946.

As of September 1, 1945, authorized cases totalled 1,000,000.

As of September 1, 1946, authorized cases totalled 1,100,000.

an appropriation of \$42,800,000 and for the succeeding fiscal year 45 millions. All told, the plea from Fort Lewis gave direction and momentum to an activity that involved the national government, all of the states, all state and many local health departments, a large part of the medical profession and the general hospitals, over one million families, and over 117 million dollars.

All this might imply that EMIC was born and grew to immense stature without friction, criticism, or acute issues. But to many public health administrators who were closely associated with the program during its most intensive period, EMIC was a source of irritation. It is not an unusual state of affairs for public health workers to be dissatisfied with their own work. In this case, however, the dissatisfaction cannot be explained by the healthy urge to attain perfection.

Few will question the background of accomplishment to which the Children's Bureau can point. But despite strong support, in no period of its history, with the exception of those first years when its activities were limited to research, has there been an unqualified professional acceptance of its existence. For the purpose of this discussion the many particular issues of the past are secondary, but the fact that there were conflicts that resulted in submerged and smoldering antagonisms is important.

In much of the war effort that attended the production of ships, shells, planes, tanks, and bombs, the undertakings were without precedent. The lack of preparation and precedent contributed to many mistakes, but these were condoned because it was recognized that, lacking guiding experience, the process of trial and error is the alternative. The only assurance demanded by the American public was that there be no evidence of venality in any action or failure to act.

In contrast to the usual war emer-

gency agencies, EMIC was placed in an entirely different position. The first appropriation by Congress was made upon the assumption, supported by the testimony, that EMIC was not a new program but the expansion of an existing one. Thus, its organization and administration were assigned to an old agency rather than a new one created by the war and, automatically, EMIC became attached to a long series of precedents. With such an urgent need for an accelerated administrative tempo, and without guiding experience, it was certain that mistakes would be made and precedents would be violated.

One of the first casualties among precedents was the established formula of federal-states relations. This is a formula where the diplomatic amenities are of crucial importance. Time must be expended lavishly—time for conferences, time for education, time for extended negotiations and compromises leading to agreement. And one of the most rigid rules of federal-state etiquette is that neither by act nor expression should the representative of a federal agency dominate or attempt to dominate a state agency. Whatever may be the substance of a program, this form must be maintained.

In the atmosphere of war the concept of getting the job done regardless of costs and feelings usually prevails. Getting the job done in EMIC was the primary concern and, no matter how great might be the verbal emphasis upon states' rights, the need for speed and the movement of patients across state lines forced the central administrative agency into a position where the program became federal rather than federal-state, in the usual sense. Ordinarily three months would be required to complete arrangements for preliminary discussions; in this instance and within the same period the plans of thirty-eight states had been approved by the Children's Bureau. Without a detailed

master plan that served as a blueprint for the state plans there would have been months of delaying negotiations.

The need for speed brought its predictable responses. Regulations were adopted covering the details of administration, and new experiences resulted in changes in regulations. Those affected by the changes felt harassed but this, in itself, did not differ greatly from other war efforts. Where EMIC differed was in the tendency of those concerned with administration to view the program with one eye on the immediate task and one eye on future policy. The interesting feature of the phenomenon is that both the Children's Bureau and the state health departments were concerned over the possible effects of EMIC on future programs. With an eye to the future, what state health departments saw and interpreted as federal domination was disturbing to them.

The Children's Bureau also observed in EMIC some possible post-war difficulties. Getting the job done was the primary ask, but getting it done regardless of costs was another matter. As a cost of war, a fee of \$50 or \$150 for maternity care is relatively unimportant. But if the fee is regarded as a possible pattern of post-war costs of maternity care it becomes extremely important. Hence, in this aspect and many others the actions of the Bureau were more in accord with a peacetime outlook than a wartime psychology.

These are some of the causes that are discernible in criticisms of EMIC. There is one, however, that perhaps outweighs all of those mentioned. EMIC was launched in a period when there was great debate on the subject of a national health plan. In a short time it became apparent that EMIC was a national health plan. Those who regard EMIC as a complete preview give too little attention to its emergency characteristic—the need for speed. They say, "This is it" and assume that what happened

in EMIC, be it good or bad, will happen in any national health plan. The assumption gives little credit to the process of learning by trial, error, and experience. If EMIC is regarded as an administrative laboratory, the lessons in it are of incalculable value. They may be applied to a wide variety of situations—national health plans, state health plans, and others. Whether they are applied by national or, particularly, by state and local health departments is a question that cannot be answered now because the future administrative rôle of these departments remains in doubt. But, whatever the agency, the lessons are pertinent.

EMIC demonstrated that the most crucial period in the existence of any large scale plan is that period *before* the distribution of any service begins. While this is no new principle of administration, what EMIC contributed is a much more tangible concept of how much time is needed and how the time must be used. Between the decision to adopt a plan and the delivery of services, a period of at least a year should elapse. Without such a "get-ready" period the plan will duplicate much of the adverse experience of EMIC.

EMIC began without sufficient trained personnel in the Children's Bureau and without sufficient trained personnel in the states. It is in this light that the amazing accomplishments throughout the country must be viewed. But one such demonstration is more than enough to show the pressing need for administrative personnel and to indicate how intensively a training period of a year must be used. Intensive training introduces another responsibility, the development of training facilities and teaching personnel. If this responsibility is not met by schools of public health, as a part of their own "get-ready" period, a chaotic educational effort will result.

The training of personnel and the

testing and perfection of administrative mechanisms are only parts of the work during the preparatory year. A far-reaching program of education is vital to the future success of the health plan. If the Children's Bureau and the state health departments had had a year to confer with and acquaint the medical profession, hospitals, and potential recipients of service with the details of EMIC, how much misunderstanding would have been prevented! And how much would have been learned about the applicability of proposed rules and regulations!

Probably the most outstanding contribution of EMIC to the field of health administration is related to hospitals and hospitalization. The contribution, based upon previous experience with the services for crippled children, involves hospital standards as well as hospital costs. There is a striking agreement among hospital administrators that the EMIC formula for hospital payment, which is based upon the costs of hospital care, focused attention upon a subject that should have been considered long ago. And the EMIC standards for hospital facilities threw new light on the hospital needs of the nation.

It was by one of those significant circumstances that, through EMIC, state departments of health became associated with problems of general hospital administration at a fortunate time.

It was after the EMIC program started that there appeared on the agenda of Congress the Hill-Burton proposal to grant federal funds for hospital construction. In August, 1946, Senate Bill 191 became Public Law 725. Under this law the combined federal and state expenditures for hospital and health center construction may approximate one billion dollars in five years. The federal administrative agency is the U. S. Public Health Service, and any state wishing to avail itself of federal

funds must meet these two requirements, among others.

1. A single agency must be designated to plan and, within the framework of federal rules, carry out an approved construction program.

2. Minimum standards for the maintenance and operation of hospitals that receive federal aid must be adopted.

The most logical single agency in a state is the health department. Because of the EMIC program, all of the state health departments have gained at least some experience that should be valuable in this new development. Of course, the most fortunate states are those with a background of experience acquired through the enforcement of hospital licensing laws.

If any regret is in order it lies in the failure of the states to prepare more adequately for the administration of Public Law 725. But this much appears to be certain: As direct payments to hospitals by private patients decrease and payments from public agencies increase, the responsibility of determining what are reasonable charges for services in each hospital will fall upon the "single state agency." Hence, for those departments that would remain aloof from the controversial issues of medical and hospital administration, designation as the single state agency should be avoided.

EMIC demonstrated also how delicate is the subject of medical specialization. At first glance the designation of specialists in a national or state health plan appears to be disarmingly simple. The administrator of such a plan, aided by an advisory body, is charged with the responsibility of preparing and publishing a list of those who are qualified. And the list is expected to be a duplicate of the names approved by American Specialty Boards.

The first reaction to the proposal that a public administrative agency designate specialists comes from the medical pro-

fession. The charge is made that the function is outside the province of public administration and is an unwarranted encroachment on the prerogatives of the profession. The issue appears to be one of those for which people fight and die and their friends wonder why. Up to this point the controversy seems to revolve around the issue of what agency will publish names from a list already published.

In EMIC the state agencies accepting the profession's declaration of prerogatives placed the responsibilities of designation upon the profession in the states and local areas. It was then that the realities of the situation began to assert themselves and simplicities became complexities.

The designation of specialists becomes an important matter when it is proposed that, for the same service, a specialist receive a higher fee than that of the non-specialist. In EMIC the difference amounted to 50 per cent. Higher fees for those with specialized training is generally accepted as a part of the tradition of private practice. But it has never been formalized as it must be if it becomes an accepted policy in any system of organized payment.

The obstacle to the designation of specialists, and, therefore, to the payment of higher fees, is seen in the informality of specialization in the United States. There are fifteen American Specialty Boards and the standard of each one is high, but this does not mean that a physician who specializes must be approved by the particular Board. Thus, in the same community there may be an approved specialist, another physician not approved but nonetheless specializing, and a third physician not approved but specializing to the extent of 50 per cent of his practice. Are all to be given approval and, if so, what standards should replace those of the American Specialty Boards? It was in the face of such realities that the pre-

rogative of designating specialists was pushed into the background. The whole experience has had its sobering effects and EMIC has demonstrated the need of a new approach to the problems of payment and their relation to the specialization of practice. The problems are inherent regardless of whether a national or state plan under government or private auspices is being considered.

One of the phenomena of national state and local administration is the movement of criticism from the bottom to the top. Inflexible central administration in the state can be as uncompromising as this type of administration for the nation. In a state where the severe denunciations of central administration by the Children's Bureau are most pronounced it is not unusual to hear local administrators make the same criticism of rigid central administration in the state. The subject warrants attention because in too many cases it is assumed that the problems faced by EMIC would be solved with ease if the state, rather than the nation, were the basic unit of administrative authority. The assumption and the evidence are not in accord.

Considering the administrative problems that faced EMIC, it is very doubtful that they would be less acute if a like program or an expanded health program were limited to a state. Almost any state, and certainly any populous state, would be forced to adopt either a flat fee schedule regardless of geographic area or the qualification of the physician, or a fee schedule that would vary according to these two factors. As stated, the policy of EMIC was to vary the fees according to qualifications but not according to rural or urban practice. As a result, the basic obstetrical fee of \$50 met with a fairly favorable response among rural physicians. However, it is much less likely that rural physicians would look with favor on a higher fee

for a service rendered by a general practitioner in an arbitrarily defined urban community. In the public mind, higher fees are usually associated with higher quality. It is fairly certain, therefore, that pressure would be exerted by the profession in the smaller communities for a flat fee at the level of urban payment.

What has been said also about the designation of specialists would not become a less acute problem under a state system or a grant-in-aid program. This statement is not made in support of a federal program; it is intended to emphasize the fact that complex problems do not suddenly simplify merely because administrative authority is concentrated in a state. Nor do they simplify when the authority is voluntary rather than governmental. With respect to the problems described, the voluntary plans have contributed little.

One final example of lessons from EMIC will be presented; many others will be included in a forthcoming report of a field study.\* The example involves the quality of service and the methods that might be used to improve it. The EMIC program raises the old question of whether the chief dependence should be placed upon education or regulation. And the answer appears to be "both." Regulation is necessary for the improvement of facilities; with respect to medical service it is a doubtful procedure in a long-range program. Under the pressure of time, a divided fee for obstetrical care, as a way to assure or increase antepartum and postpartum care, may be justified. But in a continuing program improved services based upon sound public and professional educational efforts generate less antagonism and create fewer administrative problems. As a sidelight upon the future of ob-

stetrical care in the United States, it is significant that hospital facilities have been improved and, further, that those expectant mothers who have had an experience with a high quality of care expect that type of service and are critical unless it is received.

The many administrative lessons in EMIC will be valuable or valueless according to the outlook of public health administrators. The present period is one of indecision in spite of the Official Statement adopted by the American Public Health Association in 1944.\* As long as the indecision persists, the type of experience provided by EMIC will be viewed negatively, *i.e.*, adverse experience will be emphasized as reasons why health departments should "stick to their knitting," enlarging, perhaps, but not changing the forms of their work. If this describes the position of state and local health departments it is quite understandable that EMIC should be viewed as an unwanted burden forced upon them by the war. Whether the position is a realistic one and in the interest of adequate health administration is another matter.

Somewhere in the structure of state administration there must be preparation for medical and hospital administration. One event has already occurred and certain responsibilities of hospital administration are being placed upon state health departments. But there are other events involving medical administration that are already over the horizon. It is a safe prediction that legislation for disability compensation will be enacted in many states, and good administration requires that an official agency issue the necessary certificates of incapacity. Will state health departments take the position that this is a task that is to be performed by departments of unemployment compensation?

\* To be published by the Bureau of Public Health Research of the School of Public Health, University of Michigan. The study was made possible through grants of funds by the Ford Foundation and the New York Foundation.

\* Medical Care in a National Health Program. *A.J.P.H.*, 34, 12:1252 (Dec.), 1944.

If so, departments of unemployment compensation must develop their own system of state and local medical administration. If disability compensation, like workmen's compensation in the past, expands to include medical service for those disabled, it is unlikely that this type of medical administration will be relinquished to state health departments.

It is useless to adopt resolutions of protest against the multiplicity of health or medical administrative agencies without taking positive steps to prevent pre-

dictable duplications. Also on the horizon of health legislation are many other state and national proposals for medical and hospital care. Whether attention be centered upon a bill sponsored by Senator Wagner or Senator Pepper or Senator Taft, the characteristic that is common to all proposals is the complexity of administration. It was to the processes of administration that EMIC made distinct contributions; the lessons of EMIC assume greater importance when the interpretations are made in the light of impending events.

## Best Sellers in the Book Service for August

An Appraisal Method for Measuring the Quality of Housing: A Yardstick for Health Officers, Housing Officials and Planners.	
Part I. Nature and Uses of the Method, 1945.....	\$1.00
Part II. Appraisal of Dwelling Conditions, 1947.....	5.00
The Control of Communicable Disease, 6th ed. 1945.....	.35
Diagnostic Procedures and Reagents, 2nd ed. 1945.....	4.00
Microbiology of Foods. Tanner. 2nd ed. 1944.....	12.50
Microbiology of Meats. Jensen. 1944.....	5.50
Milk and Food Sanitation Practice. Adams. 1947.....	3.25
Penicillin Therapy. Kolmer. 2nd ed. 1947.....	6.00
Standard Methods for the Examination of Water and Sewage. 9th ed. 1946.....	4.00
Standard Methods of the Division of Laboratories and Research of the New York Department of Health. Wadsworth. 3rd ed., 1947.....	10.00

Order from the Book Service  
AMERICAN PUBLIC HEALTH ASSOCIATION



# Next Steps in Industrial Hygiene Research\*

PAUL A. NEAL, M.D., F.A.P.H.A.

*Medical Director, Laboratory of Physical Biology, National Institute of Health, Bethesda, Md.*

THE field of industrial hygiene research is as wide as the scope of human activity. Protection of human beings from hazards of their occupational environment exacts research demands which are highly diversified and extremely complex. This complexity is emphasized because the work is not related to a single disease entity, with specific manifestations, causes and cures. It is further complicated because the industrial scene is never static.

Just after the turn of the century it became increasingly apparent to industrialized countries that it was poor social and business economy to subject workers to avoidable industrial hazards. Following each war there has been a wider recognition of this utilitarian value of industrial hygiene research.

Industrial hygiene research is thus so unlimited in scope that one is in a dilemma even when he tries to draw a distinction between industrial hygiene research and general public health research, because the former covers many phases with regard to the working environment which the latter covers with reference to the general population.

In general, at present industrial hygiene research concerns itself essentially with the effect of different environmental factors on the normal

worker, and may be divided into the following categories:

1. Effect of physical factors, such as abnormal temperatures, humidities, and pressures, noise, vibrations, etc., on the worker
2. Effect of posture, fatigue, rest pauses, physical fitness, infectious agents and susceptibility to disease, on the organic function of the worker
3. Effect of gases, vapors, fumes, and dust on the worker
4. Effect of radiations and nuclear particles on the worker

## ENVIRONMENTAL PHYSIOLOGY

Numbers 1 and 2 above are usually discussed under the general term of environmental physiology.

The extent to which research has been undertaken in the United States on environmental physiology has never been on a par with its importance. It is odd that a country with industry as technologically advanced as in the United States has not devoted more effort to this field of research. The operation now and in the future of complex machinery and technical processes demands of the industrial worker a high level of functional capacity and training. For example, with the approach of a new era in air transport, aircraft engineers and designers are rapidly realizing that unless human requirements and limitations are carefully assessed, and balanced, aircraft impossible for human occupancy and control with any acceptable degree of safety may be produced. Similar con-

\* Presented before the Industrial Hygiene Section of the American Public Health Association at the Seventh Annual Meeting in Cleveland, Ohio, November 12, 1946.

siderations may be applied successfully throughout industry in the adaptation of the machine to suit men rather than the adaptation of men to suit machines.

Present physiological knowledge does not allow the full statement of man's capabilities. The physiological approach to these problems involves the study of the range of human function. For example, we must have information on what a particular task demands of the worker's motor system, sensory system, and capability for adaptation and acclimatization. This requires a knowledge of the physiological limits of these several functions. Obviously, this body of knowledge is far from complete and the establishment of such fact is the proper function of physiological research.

The integrated details of such physiological approaches border on consideration of comfort and morale, and it is probable that these factors must be studied in relation to the worker's task. For example, recent work has indicated that adjustment of industrial processes to "comfort of workers" results in a significant increase in work output. The lack of mental stress under these conditions is a morale factor of great importance in labor management relations.

#### TOXICOLOGY

At present toxicology may be defined as the *unfavorable* effect of drugs and chemicals on the *normal* organism in contrast to pharmacology which may be defined as the *favorable* effect of drugs and chemicals on the *diseased* organism. The interpretation of the word toxicology has been gradually changing over the past years. At one time it was devoted solely to the analysis of the stomach contents of a person who had been suspected of being poisoned by some chemical.

Later, as more information was obtained concerning the gross action of

many substances (such as corrosive agents), the means for neutralizing or combating the immediate effects of such agents became a part of "toxicology." Later still, the term came to include the effects of toxic chemicals on workers in industry, the toxicological information being obtained from observations by a single individual of the industrial environment on the workers who were obviously ill.

Later, field epidemiological studies were undertaken in which the environmental exposures were quantified and physical examinations were performed on the workers. It was thought that by the study of the data collected, the toxicity of the substances in question could be determined and engineering and medical control procedures defined. It is apparent that laboratory research had to precede such studies in order to develop methods for quantifying the environmental exposures as well as to define the early symptoms and signs of such exposures on the individual. The control procedures developed by such laboratory and field studies in the past decades are now generally accepted and, with few exceptions, the working environment has been remarkably improved. For example, severe lead poisoning in printers and painters is relatively rare, and mercury poisoning in hatters is no longer a menace.

At present, industry and labor demand that the toxicity and potential dangers of new chemicals, or old chemicals used in new processes, be defined, and that safe medical and engineering control procedures be available before any workers are exposed. Safe control procedures are now defined as methods that will prevent not only definite illness, but also will prevent minor physiological impairments. Therefore, in the laboratory evaluation of toxic agents or harmful environmental situations, it no longer suffices to produce acute injury in the experimental

animal and then simply to tabulate mortality or gross changes. It appears imperative that in the future toxicological research should concern itself much more than heretofore with detailed studies of certain chemicals on the physiological and biochemical response of the organism, and that such effects as may be found be followed in series of homologous substances in order to discover the mechanism of action of such chemicals and the laws which control such effects. It is obvious that such detailed research cannot be performed by a single individual, but that it requires the teamwork of a number of disciplines, as pharmacologists, physiologists, biochemists, cytologists, enzymologists, and biophysicists. Such investigations are not only concerned with the effect of such chemicals on organ function, as heart action, liver and kidney function, but it has also to delve into the response of individual cells and enzymes, which includes the carcinogenicity and allergic potentialities of such chemicals.

The toxicologist must determine just what the toxic agent does to the body's economy. This means finding out how it affects the metabolism of normal body constituents, and how it affects nervous and hormonal mechanisms and the function of the various enzyme systems. In addition, he must determine exactly and in minute detail how the body reacts to the foreign agent. This means finding out how the agent is metabolized, what its end products are, and where these chemical transformations take place. Real progress in toxicology depends on carrying out such fundamental investigations. As an example, one may cite the studies done in Great Britain and in the United States on lewisite. It was found that this toxic gas had a great affinity for certain sulfur groups in protein, the —SH or sulfhydryl groups. Various vital enzymes must have these sulfhydryl

groups intact, else they become inactivated. These enzymes could be protected, and the whole organism could be protected, by means of several synthetic compounds containing two sulfhydryl linkages in the molecule. One of these is BAL, whose usefulness in arsenical, as well as mercury poisoning, is becoming well known.

As another example of a thorough toxicological investigation the studies on diisopropyl fluorophosphate (DFP) may be mentioned. The most recent techniques in enzyme chemistry, pharmacology, physiology, and biophysics were used in evaluating this toxic agent in several laboratories. It was found that DFP irreversibly destroys the enzyme cholinesterase. This effect might be desirable in certain conditions like glaucoma, and clinical trials have been started. If the tests prove successful, it would provide an interesting situation, where fundamental studies of a toxic agent have disclosed therapeutically useful properties.

Unfortunately, the role of —SH groups described above is a rather isolated island of knowledge surrounded by mystery still too deep regarding the mode of action of numerous other substances which do *not* appear to exert their effects by this route. In fact, even the sulfhydryl picture has many gaps requiring further investigation, such as how the enzyme effects can be correlated with the details of pathology and the clinical course of poisoning by the agents studied. As a result, toxicology has come to depend more heavily than ever on fundamental findings concerning the properties of living matter. As the frontiers of knowledge concerning the *normal* cell are advanced the toxicologist will be given new tools for application to his particular interests. In a sense the appellation "toxicology" has lost much of its original definiteness —and, just as industrial hygiene has

come to involve essentially preventive medicine and public health in all their aspects, toxicology can be said to involve pharmacology, physiology, biochemistry and even biophysics in addition to pathology and clinical medicine.

Over the last generation, sanitary engineers have provided us with safe milk and safe drinking water. Unsafe air is probably just as much a hazard to the health of society as unsafe food and water. It is going to be a problem of the immediate future to establish satisfactory safety standards for the air we breathe and to see that these standards are enforced. These standards cannot be properly defined until fundamental research has provided them with a sound basis of fact any more than proper standards for milk could have been set before the pertinent bacteriology of the typhoid and tuberculous organism had been established. Foul air is not simply smoke-laden air or air contaminated with toxic dusts and gases in a factory. Upper respiratory diseases, including the "bad cold," cause several times as much sickness absenteeism as do occupational diseases. At present, we know that "bad colds" are contagious and that in their transmission the air we breathe plays an important part, but it remains for future research to determine how important this part is and its mechanism of transmission.

There has been work in the past—a great deal of work—done in the study of air pollution, but new research tools are steadily being developed which can be applied to its unsolved problems, and it is essential that we should continuously reconsider these problems in the light of these new tools and utilize them for what they can contribute. For example, a large proportion of the toxic and infectious particles in contaminated air are too small to be seen with the ordinary microscope. They all fall, however, within the range of the electron

microscope which is directly revealing particles of molecular size. With it, we can then begin to study these extremely minute air-borne particles which by reason of their small size can gain entrance to the alveolar spaces of the lungs.

#### RADIATION BIOLOGY

The recent developments in atomic energy have opened up possibilities for biological research that are difficult to overestimate. However, the potential health hazards incident to the industrial and scientific development of nuclear energy are great, especially when one realizes that one of the major obstacles to the use of such energy is the protection of human beings from radiations. In addition, the development of improved electro-nuclear devices, such as synchrotrons, accelerators, and frequency modulated cyclotrons pose new health hazards as well as provide new tools for biological research. The continued expansion of the industrial use of radiations of ever increasing intensity, such as 2 million volt x-ray equipment for the study of castings, demands fundamental biological research for the protection of workers.

The preceding statements are expressions of the fact that the Public Health Service has become increasingly cognizant over the past few years of its overall responsibilities in the matter of employing these new concepts in its research in cancer, gerontology, infectious diseases, physiology and toxicology, etc., as well as to work out procedures for the protection of the individual.

The public health aspects of these recent developments in nuclear energy may be considered under two general headings: (1) health physics or methods for the prevention of injury from radiations, and (2) the use of these new tools in biological research.

With regard to the protection of the individual, it is imperative that the in-

formation at present available on medical and engineering control procedures be more definitely formulated and more generally distributed. This must be accompanied by the training of personnel of various disciplines in order that an integrated application of this knowledge may be possible.

The use of these new tools in developmental and fundamental research in industrial hygiene offers great promise. At the present time, it appears that the greatest contribution which the recent developments in nuclear energy can offer to toxicological and environmental physiological research is in the field of radioactive tracers. A better understanding of the hazards involved will demand a continuation of the study of practical problems in order that safe control procedures may be established.

For many years the National Institute of Health has been conducting fundamental and applied research on the biological effects of low energy radiations, especially ultra-violet, and more recently on high energy radiations—x-ray, gamma and neutrons. As a natural sequence, the National Institute of Health has become associated with the Clinton Laboratories, operated by the Monsanto Chemical Company. This

coöperative undertaking has resulted in the establishment of a Biological Research Division at Clinton Laboratories. Dr. Alexander Hollaender, principal biophysicist of the National Institute of Health, will direct the program as head biophysicist assigned to the Clinton Laboratories. He will be associated with Dr. Eugene P. Wigner, Research Director of the Laboratories. This coöperative undertaking will allow the National Institute of Health to utilize these new tools, particularly high energy radiations and radioactive isotopes, in their present and future research programs, as well as to train personnel in the increasingly important field of personnel protection.

A joint program is being developed by the National Bureau of Standards and National Institute of Health which would establish in the Washington area a radiation laboratory, including pile facilities for fundamental research in the chemical, physical, and biological aspects of high energy radiations.

Dr. Edward U. Condon and Dr. R. E. Dyer, Directors, respectively, of the National Bureau of Standards and the National Institute of Health, will present preliminary plans to the Atomic Energy Commission as soon as possible.

# The Present Status of Vaccination Against Influenza\*

## PROPHYLACTIC EFFECT OF VACCINE

THE evidence for protective effect of vaccination against influenza with combined A and B virus vaccine resides largely in studies carried out by the Commission on Influenza, Army Epidemiological Board. In the winter of 1943-1944 an evaluation of the effect of vaccination against influenza A was made. In this study (*Am. J. Hyg.*, July, 1945) which was carried out in Army Specialized Training Program units in different universities throughout the United States, approximately 6,250 individuals received vaccine, and a similar number received control inoculations. During the epidemic of influenza A which shortly ensued, the incidence of clinical influenza in the vaccinated group was 2.2 per cent and in the control group 7.1 per cent. In all but one group the trends were similar and in some instances the ratio in favor of vaccinated individuals was considerably higher.

It is evident that complete protection was not obtained, but it must also be recognized that the 1943 studies were carried out with the first preparations of vaccine made on a large scale.

In 1945 observations on the effect of vaccination against epidemic influenza B were possible by virtue of the Army program of general vaccination. At the University of Michigan there were 600 vaccinated men in the Army unit while in a unit of another service there were 1,100 unvaccinated men. Both groups

were cared for at the University Student Health Service under similar regulations for admission to hospital. During the epidemic period of November and December the incidence of admissions in the unvaccinated group was 9.9 per cent and from the vaccinated group 1.1 per cent (*J.A.M.A.*, May 25, 1946). At Yale University conditions were almost identical as to numbers and in the character of the observations. There the incidence of influenza in the unvaccinated group was 12.5 per cent and in the vaccinated group 0.5 per cent (*Am. J. Hyg.*, Jan., 1947). While neither of these studies was alternately arranged as was the one against influenza A, the results seem clear.

Evidence obtained in the 1943 studies indicates that the effect of the vaccine appears in about one week.

## DURATION OF EFFECT

The duration of protective effect is not established. In all studies referred to, vaccination had been conducted only a few weeks before the onset of the epidemic. Certain observations made in institutions (*J. Exper. Med.*, Oct. 1944, *Am. J. Hyg.*, Nov. 1945) indicate that as long as 1 year after vaccination its influence was detectable, statistically, in reduced incidence of disease among vaccinated individuals, although it is by no means certain that with present procedures a satisfactory degree of resistance can be maintained for so long a period. The data indicate, however, that resistance is not limited to a period of 4 to 6 weeks, but more study is required to define the effective period.

Indirect evidence as to the effect of vaccination is seen in the stimulation

\* Report of the Study Committee on Influenza Vaccination of the Subcommittee on Evaluation of Administrative Practices, Committee on Administrative Practice, American Public Health Association, April, 1947.

of antibodies and their persistence. In vaccinated groups the mean antibody response reaches its height about 2 weeks after the inoculation of the vaccine, declines approximately one-third in 4 to 5 months, and to about one-half its peak level in 1 year, although it still remains well above the prevaccination level. If, as is generally assumed, there is a correlation between the height of antibody level and resistance, these data offer support to the interpretation of an extended influence of vaccination. It cannot be accepted at present, however, that the duration of resistance is parallel to the persistence of antibody levels. Individual variation occurs and a certain proportion of individuals fail to obtain a satisfactory response. Moreover, certain individuals tend to lose antibody more rapidly than the majority. Where doses of reasonable amount are used there is little evidence that repeated inoculations at short intervals afford any advantage.

#### SPECIFICITY OF EFFECT

On the basis of present knowledge, influenza virus vaccine appears to have an effect of a rather specific nature against infection by influenza A and influenza B. There is no evidence that vaccine influences the incidence of common colds and other unidentified respiratory infections. Nor is the effect of vaccine as now constituted against all the possible variant strains known. There is no satisfactory evidence of protection against such an epidemic as that of 1918.

#### REACTIONS TO VACCINE

In a proportion of individuals influenza virus vaccine given subcutaneously elicits a reaction similar to a mild reaction to typhoid vaccine. There is commonly redness and tenderness for a few days at the site of inoculation; in recent experience involving many thousand inoculations, less than 1 per

cent of those receiving the vaccine were observed to have fever. This is usually of no more than 24 hours' duration, and the aches and discomfort which accompany fever ordinarily can be controlled by the use of mild analgesics. Evidence points to the fact that the frequency of this form of reaction is related to the amount of virus present in the vaccine rather than to extraneous egg materials. The number of reactions with purified material increases as the virus content of the inoculum increases. It is suggested that material which has aged gives fewer reactions than freshly prepared material. Experience to date indicates that children are more prone to sharp febrile reactions than are adults. It might be suggested that, for children under 5 years of age, 0.1 to 0.3 ml. be given; from 5 to 10 years, 0.5 ml.; above 10 years of age the full dose, 1.0 ml.

No jaundice or central nervous system disturbances have been seen to follow influenza vaccination.

Practically all preparations at present being recommended are prepared from the allantoic fluid of the developing chick, which ordinarily is not a highly sensitizing material. It should not contain yolk, membrane, or egg white, except as this may accidentally enter in the course of production. Because of the source of material, however, the possibility of anaphylactic reactions must be kept in mind. In the large number of individuals who have been inoculated to date, such reactions have been extremely rare. Nevertheless, because they have occurred, it is imperative that careful histories be taken to determine the presence of asthma or urticarial sensitivities to chickens and eggs. Epinephrine and other anti-spasmodics should be readily available. It has been suggested that all individuals should receive skin tests before receiving vaccine. This seems unnecessary if other precautions are

observed. Vaccine has been given without disturbance to a good proportion of individuals who give histories of mild or moderate allergy to eggs, but skin tests should be done in these instances before vaccine is administered. If the history is marked or if there is any hesitancy about the decision, vaccine should not be given.

Data obtained up to the present time do not suggest that vaccine has a prominent sensitizing effect. This statement is based upon experience in individuals who have been vaccinated a second or third time. Further observation is required to determine whether sensitization will increase in frequency with additional inoculations.

The question has been asked recently concerning the administration of vaccine to pregnant women. There are no obvious contraindications other than those suggested above.

#### PREPARATION OF VACCINE

Most of the clinical evaluation in Army groups was made with vaccine material absorbed to and eluted from embryonic chicken erythrocytes. Since that time several producers of influenza vaccine have sought to eliminate unnecessary materials in the egg fluids. Various biological houses have been developing preparations by precipitation, centrifugation, etc. These products are licensed by the National Institute of Health and are required to pass similar potency tests for release. If they present adequate virus content and stability without disproportionate pyrogenic effect, they are probably prophylactically effective. Technical development of vaccine has not reached the final state and it seems unwise at the moment to seek minimal effective dosage.

#### GENERAL APPLICATION

Influenza A has occurred in epidemic form at intervals of 2 to 3 years; in-

fluenza B, at intervals of 4 to 5 years. It was anticipated on the basis of the preceding experience that an epidemic of influenza A would occur in the winter of 1946-1947; blustery, irregular outbreaks of the disease were identified in the spring. The time of the recurrences cannot, however, be rigidly predicted. Although the epidemics have been widespread, the clinical disease has been generally mild and of comparatively low incidence. The resistance induced by vaccination is not known to persist effectively from one season of prevalent respiratory infections to another, and the expense of the vaccination must be considered.

In view of these considerations, a recommendation for general employment of influenza vaccine by health departments is not warranted administratively at the present time.

On the other hand, in certain groups the prevention of influenza even in a mild form is to be sought. These comprise older individuals in whom the case fatality tends to be high, the debilitated or others to whom infection presents undue risk, industrial groups and essential public service personnel in whom even temporary incapacity constitutes a serious problem, and institutional groups or university students for whom facilities for care when sick are limited. The highest incidence of the disease is in children, but the mortality is extremely low.

Under these conditions the question of when vaccination should be given is open to discussion. For a large population, geographically widespread, it seems possible to gain full advantage only if vaccination is conducted in advance of the appearance of influenza A or B. On the other hand, in institutions or closely knit industrial groups, vaccination might well be withheld until evidence is obtained that epidemic influenza is occurring. However, the speed at which the disease disperses is



so great, and since the interval between inoculation and effect is at least a week, there is difficulty in carrying out the program in time to secure its advantages.

NOTE: For 1947 results, see Francis, Thomas, Jr., Salk, Jonas E., and Quilligan, J. J., Jr. Experience with Vaccination Against Influenza in the Spring of 1947. *AJPH.*, 37, 7:1013 (July), 1947.

*Study Committee on Vaccination  
Against Influenza*

THOMAS FRANCIS, JR., M.D.,  
*Chairman.*

VLADO A. GETTING, M.D.

BETTYLEE HAMPIL, Sc.D.

GEORGE K. HIRST, M.D.

JAMES P. LEAKE, M.D.

WILSON G. SMILLIE, M.D.

---

## Milwaukee's Hall of Fame

Milwaukee has an annual Hall of Health made up of a health day forum and exhibits, and an additional program prepared by the Medical Society of Milwaukee County and its Women's Auxiliary. Exhibits are prepared by health and social agencies while the City Council provides the auditorium halls.

The 1947 Hall of Health was held in May. Among the public exhibits were three by the U. S. Public Health Service on early detection and treatment of tuberculosis on a mass scale, industrial hygiene and early detection in cancer control, respectively; one by the Army Medical Corps on "dynamic convalescence"; and several by the American Medical Association on the history of American medicine, hay fever, and pneumonia; and one by the Army Air Force on protection of crews and passengers in high altitude flying.

The outstanding feature of the 1947 exhibit was provided by the Milwaukee chapter of the Wisconsin Society of Professional Engineers. This is a large

oil painting, "Engineering and Health," by George E. New, Ph.D., a well known artist. The painting, seven by four feet, depicts the engineering profession's contribution to better health. The four corners symbolize the areas in which engineering has made its greatest contribution. The central figure holds a flaming torch to symbolize engineering lighting the way.

The placard accompanying the painting says in part, "Eye-saving illumination, pure water, air-conditioning, heating and refrigeration—these products of engineering skill are a part of our daily living. Engineering rears great buildings, safe and comfortable for us to dwell and work in. Through irrigation it increases the fruitfulness of our life-giving soil. It provides swift transportation and communication to bring healing aid. It makes the instruments to find and fight disease. Men in all branches of engineering turn the discoveries of science into practical use for the service of the people."

# Food Values of Dairy Products as Affected by Methods of Handling in Production, Distribution, and Use\*

Riboflavin, Thiamin, Vitamin A

*Food and Nutrition Section*

THE Committee on Milk and Dairy Products has surveyed recent research studies in an attempt to determine the effect of many factors operating between production and consumption, which may influence the ultimate nutritive values of dairy products.

Obviously, it was impossible to draw general conclusions regarding food values when several dairy products were considered and many possible affecting factors were analyzed. The only course for the committee to take was to limit the scope of the study to a consideration of a few nutrients. The following report, therefore, is based on recent literature (1940-1946) pertaining chiefly to the nutrients: riboflavin, thiamin, and vitamin A.

Each of the dairy products—milk, butter, cheese, and ice cream—is considered here from the standpoint of factors which may affect their riboflavin, thiamin, and vitamin A values. Milk as the basic product from which all dairy foods are made is considered first, from production on the farm to use in the home.

## RIBOFLAVIN IN MILK

The fact that milk is an excellent source of riboflavin makes it important

to know what factors in production and handling of milk affect its riboflavin content and which of these factors can be controlled to assure a maximum concentration of riboflavin in the milk. The feed of the cow is naturally a first consideration.

*Ration of the Cow*—The literature indicates that the riboflavin content of milk *can* be influenced by the feed of the cow. However, increasing the riboflavin intake of the cow by 30 to 50 per cent, as reported in one study, caused only a temporary increase in the concentration of the riboflavin in milk. In the same study, a good winter ration maintained milk riboflavin at pasture levels.<sup>1</sup> According to another report, cows transferred from winter rations to young green pasture gave *more* milk but with slightly lower concentration of riboflavin.<sup>2</sup> Other investigators have also shown the inverse relationship between milk yield and riboflavin content of milk. In addition, they have demonstrated that the concentration of riboflavin in milk can be increased when a dry ration is supplemented with a silage.<sup>3</sup>

In spite of these apparently conflicting observations, it appears likely that milk, as produced under standardized

\* Report of the Committee on Milk and Dairy Products.  
COMMITTEE ON MILK AND DAIRY PRODUCTS

Organized 1929 Published reports Year Books 1930-1931, 1931-1932, 1932-1933, 1933-1934, 1934-1935, 1935-1936, 1936-1937, 1937-1938, 1938-1939, 1939-1940, 1940-1941, 1941-1942.

feeding and management conditions existing on modern dairy farms, is relatively uniform in riboflavin content the year around.<sup>4</sup> The fact that some synthesis of riboflavin in the bovine rumen has been demonstrated on specified experimental rations<sup>5, 6</sup> may help to explain the relatively stable riboflavin content of milk.

*Light and Heat*—The action of heat alone does not influence the riboflavin content of milk. However, heat and light acting together, may be responsible for considerable loss. The studies reporting such losses vary greatly in plan and procedure, a fact which makes it difficult to compare their results. In general, milk exposed either to direct sunlight out-of-doors or to relatively strong daylight indoors loses riboflavin, the amount of loss depending on the directness and strength of the light, the length of time of exposure, and the temperature and pH of the milk. Strong light, long exposure, warm temperature, and increase in alkalinity all contribute to losses of riboflavin. Typical studies are reviewed briefly.

In one study, milk in pint bottles, exposed to the direct sun (between mid-morning and midafternoon) on an open porch, lost from 28 to 72 per cent of its original riboflavin content, the time of exposure ranging from 30 minutes to 3½ hours. The atmospheric temperature varied from 60 to 72° F. Control samples of milk, kept in a dark room for 24 hours or in a refrigerator for 7 days, suffered no loss of riboflavin.<sup>7</sup> Similar findings are reported by other investigators.<sup>8-11</sup>

Reports also describe research designed to answer questions covering the effect of sunlight on different types of milk, on milk in different kinds and sizes of containers, and under various other conditions of practical importance.

In general, it was found that there was less destruction of riboflavin when homogenized milk (27.6 per cent) was

exposed to sunlight from 1 to 2 hours than when pasteurized (35.4 per cent) or raw milk (40.1 per cent) was subjected to the same treatment. Destruction of riboflavin in clear glass bottles ranged from 9 to 77.5 per cent (the amount related directly to time and temperature); in brown bottles from 0.6 to 5.6 per cent; in paper bottles from 0.6 to 16.9 per cent.<sup>11</sup>

A recently reported study combines an investigation of theoretical losses of riboflavin with observations of ordinary practices in handling milk, which may influence such losses.<sup>12</sup> The authors agree that losses *can* be severe but that the consumer takes greater precautions in the care of milk than is ordinarily assumed. They found, for example, that 70 per cent of all milk delivered on retail routes was removed from the doorstep or was protected from light in some manner (often by a covered receptacle) within 5 minutes after delivery. As a result, the milk lost almost no riboflavin. Only 3.3 per cent of the customers left milk exposed on doorsteps for more than 2½ hours. The authors indicate that a calculated loss of 3.25 per cent of riboflavin, after milk is delivered to the customer's doorstep, is a high estimate.<sup>12</sup>

Other interesting observations: The smaller the container of milk, the greater the destruction of riboflavin in a given time. Also, as would be expected, wooden cases for holding bottles protect milk from riboflavin losses more effectively than do wire cases; milk stored at the back of the delivery truck, away from light and warmth, has the advantage over milk placed near the door.

Losses enroute are negligible in general, except where milk is on a route for 5 hours or more.<sup>12</sup>

Another group of investigators found that chocolate milks lost riboflavin very slowly when exposed to sunlight. The average loss of riboflavin after 4 hours, for five different brands of chocolate

milk, was about 12 per cent as compared to a loss of 80 per cent for white milk.<sup>13</sup>

Proper care of milk in the home is important if the riboflavin content of milk is to be protected. In one study, conducted in a well lighted room, milk placed 5 feet from a window lost from 16 to 99 per cent of its riboflavin when held at 100° C. (boiling) for varying periods from 5 minutes to 1 hour and as the pH increased from 3 to 6.5.<sup>14</sup> When milk was allowed to simmer for 30 minutes in a covered glass pan, in a covered aluminum pan, and in an uncovered aluminum pan, the losses of riboflavin were 8 to 11 per cent; 1.1 per cent; and 10 to 12 per cent, respectively.<sup>11</sup> When quart bottles of milk were allowed to stand for 2 forenoon hours on a table in a light kitchen with east exposure, but not in direct sunlight, 3.2 per cent of the riboflavin was lost during the first trial and 4 per cent during the second trial.<sup>12</sup>

The practical application of these findings is obvious. For the most part, the properly informed consumer can protect his supply of riboflavin in milk. The need for removing milk from the doorstep *promptly* cannot be over-emphasized.

A receptacle which is *dark* and *cool* is the alternative if the riboflavin is to be retained. When the milk is taken into the kitchen it should be refrigerated immediately and continuously in the interest of protecting it from light and from warm temperature. Cooking in covered, opaque containers is a further precaution.

The question of the effect of ultraviolet light on the riboflavin content of milk is often raised in connection with irradiation of milk to increase vitamin D content. Losses, if they occur, appear to be negligible.<sup>15, 16</sup>

*Pasteurization*—Reports, for the most part agree that there is no significant loss of riboflavin in milk as a result of

pasteurization by the high-temperature-short-time method or by the holding method.<sup>3, 17-19</sup>

*Evaporation*—No loss of riboflavin was found when milk was condensed in a batch evaporator for 3 hours at 115 to 120° F. Similarly, there was no loss when milk was evaporated at 120° F. for 35 minutes and then sterilized in cans at 235° F. for 15 minutes.<sup>20</sup>

*Drying*—An extensive study of recent date on spray dried whole milk shows its riboflavin content to be equivalent to that of market milk. Samples were obtained from various areas of the world, as well as approximately one hundred samples from various parts of the United States. In addition, a much larger number of samples was obtained from a few plants. The samples of milk were studied while fresh and after various periods of storage.<sup>21</sup>

*Storage*—No loss of riboflavin is indicated in fresh milk stored for 24 hours at 40° F. in a dark refrigerator.<sup>3</sup> Likewise, there appears to be general agreement that no loss of riboflavin occurs in dry and condensed milks under normal storage conditions. Dried whole milk stored for 6 months at 100° F. (in air and also inert gas) showed no loss of riboflavin.<sup>21</sup> Condensed milk stored for different periods up to a year at 15° C. showed no riboflavin destruction. However, there were losses up to 35 per cent after 6 months' storage at 37° C.<sup>20</sup>

#### RIBOFLAVIN IN CHEESE

*Processing*—The content of water soluble vitamins in cheese will vary with: (1) the amount of whey retained in the curd, (2) the extent to which heat is used, (3) the methods of salting—*i.e.*, whether or not a brine bath is used, which tends to dissolve out the water soluble vitamins, and (4) the amount of exposure of ingredients to air and light, especially during heating.

The temperatures to which most cheeses are subjected are not high

enough to cause much destruction of vitamins. However, the exposure of heated ingredients in large vats and the stirring, cutting, and handling to which cheese is subjected may cause vitamin losses.

The limited data available indicate that about one-fourth to one-third of the riboflavin originally found in the milk from which cheese is made is retained in the cheese. In one study 23 per cent of the riboflavin of the milk was retained in day-old Cheddar cheese made from raw milk.<sup>22</sup> The percentage retention of riboflavin in day-old brick cheese was reported by the same authors to be 27.4 per cent; in blue cheese 30.1 per cent.

Pasteurization of milk, either by the holder process or by the high-temperature-short-time method had no deleterious effect on the riboflavin content of fresh Cheddar cheese, nor on the cheese during a 6 months' ripening period. Likewise, homogenization of milk, prior to making blue cheese, had no detrimental effect on the riboflavin content of that type of cheese.<sup>22</sup>

*Storage*—Sacrifice of certain of the vitamins in cheese making is possibly offset to some extent by the fact that they may be synthesized in the outer layers of some kinds of cheese during the ripening process. In one study microorganisms isolated from the surface of four kinds of cheese, synthesized considerable quantities of B-vitamins when introduced into synthetic media. Riboflavin and other B-vitamins, as determined microbiologically, appeared to increase in the surface layers of these cheeses through progressive stages of ripening.<sup>25</sup>

Other workers found the riboflavin content of Cheddar cheese relatively stable during the ripening process. There was a slight decline in riboflavin during the first 2 months of ripening but an equal rise during the final months to the values found in the fresh cheese.<sup>22</sup>

Still other investigators, after analyzing different types of cheese for riboflavin and other B-vitamins, concluded that, whereas certain other B-vitamins appear to vary with the age of the cheese and the ripening process employed, the riboflavin content of cheese is relatively stable to such variations.

#### RIBOFLAVIN IN ICE CREAM

*Storage*—One report is available on the stability of riboflavin in ice cream manufactured under commercial ice cream plant conditions from fresh, whole milk, cream (40 per cent fat), cane sugar, and gelatin. Three flavors—coffee, maple, and vanilla—were used. The "over run" was 85 per cent. Samples of each of the three flavors were assayed before and after 7 months' storage at 10° F. The loss of riboflavin was 5.4 per cent.<sup>26</sup>

#### THIAMIN IN MILK

*Ration of the Cow*—The limited number of recent studies on this subject indicate little if any change in thiamin content of milk with fluctuation in the ration of the cow. One study reports that when cows were changed from good winter rations to early spring pasture of rapidly growing grass, there was no change in the thiamin content of the milk.<sup>2</sup> Investigations indicate synthesis of thiamin in the rumen.<sup>5, 6</sup>

*Light*—No evidence was found in the literature that thiamin of milk is affected by sunlight as is the riboflavin in milk. The thiamin content of experimental and market milks irradiated to produce 400 U.S.P. units of vitamin D per quart was not reduced.<sup>15</sup>

*Pasteurization*—A few studies published between 1940 and 1943 agree to a thiamin loss of about 10 to 25 per cent (with the first figure most common). in milk pasteurized by the holding process compared with that found in the original raw milk.<sup>17, 27, 28, 29</sup> A 1945 study in which milk was assayed im-

mediately before and immediately after pasteurization by the high-temperature-short-time process reports the small loss of 3 per cent.<sup>19</sup>

*Boiling*—A study on the effect of boiling pasteurized milk in preparing babies' formulae shows a loss of 8 per cent in thiamin.<sup>30</sup>

*Evaporation*—Milk evaporated in a batch evaporator at 120° F. for 35 minutes and then sterilized for 15 minutes in 4 and 6 ounce cans showed a loss of 27 per cent of its thiamin.<sup>20</sup> Earlier findings are in general agreement with these figures and indicate a loss of approximately one-third of the thiamin content as a result of evaporation procedures.<sup>28-30</sup> Milk condensed at 115 to 120° F. for 3 hours suffered a loss of 3.5 per cent of thiamin.<sup>20</sup>

*Drying*—The most recent study available on this subject reports the thiamin content of spray dried whole milk. The authors conclude that "whole milk powder ranks with market milk" in thiamin content.<sup>21</sup> Earlier studies reported from England on spray and roller dried skim milk indicate a loss of thiamin up to 10 per cent in the spray dried product and up to one-third in the roller dried product.<sup>28, 29</sup>

*Storage*—It is reported that "under good operating conditions" no appreciable loss of thiamin occurs in the storage of spray dried whole milk, packed either in air or inert gas, even when held at 100° F. for 6 months.<sup>21</sup> Condensed milk is reported to lose up to 29 per cent of its thiamin activity when stored for one year at 15° C., and up to 84 per cent when it is stored 4 months at 37° C.<sup>20</sup> In a study of several kinds of evaporated milk the amount of thiamin destruction varied with the different milks—two samples reached 50 per cent destruction after one year's storage. Loss was presumably more rapid during the first few months and eventually reached equilibrium.<sup>30</sup>

#### THIAMIN IN CHEESE

*Processing*—Statements made in the section on riboflavin in cheese (regarding the transfer of riboflavin from the curd to the whey in making cheese), largely hold true for thiamin. The relatively low thiamin content of cheese is predominantly due to its high solubility. In a recent study on Cheddar cheese, no actual destruction of thiamin was found to take place in the process of manufacturing the cheese. However, the retention, in the cheese, of the thiamin present in the original milk was only 8.8 per cent.<sup>23</sup> A study conducted in England and reported in 1945 revealed that approximately 15 per cent of the thiamin present in the milk was retained in Cheddar, Cheshire, and Stilton cheeses.<sup>24</sup>

*Storage*—Apparently, the nutrient content of cheese with respect to certain vitamins can be augmented during storage by the synthetic action of microorganisms.<sup>25</sup> However, in the study of Cheddar cheese cited above,<sup>23</sup> there was a progressive decrease in the thiamin content of the cheese with increasing ripening period. The losses in 12 months ranged from 43 to 73 per cent. Ripening at 58° F. caused greater decreases than ripening at 40° F.<sup>23</sup> In contrast, the 1945 English study revealed that no significant losses of thiamin occurred during ripening for periods up to 42 weeks.<sup>24</sup>

#### VITAMIN A IN BUTTER AND MILK

The differences in the vitamin A potency of summer and winter butter and milk are due largely to variations in the carotene content of summer and winter feeds. This fact is clearly evident from a nation-wide coöperative study conducted by the U. S. Department of Agriculture, the Association of Land-Grant Colleges and Universities, twenty-one state agricultural experiment stations, and one federal laboratory. Over 4,000 samples of butter were

analyzed. These extensive studies of differences in vitamin A potencies, as well as possible factors relating to the retention of such values, have been fully summarized so recently<sup>31, 32</sup> that no effort is made here to refer to individual reports. High points of these studies as they pertain to the subject of this report are indicated briefly.

*Ration of the Cow*—Of the creamery butter analyzed, 35.7 per cent was considered "winter" butter with an average vitamin A potency of about 11,000 I.U. per lb.; 64.3 per cent was butter produced in summer months when the cows were on pasture, and it had an average potency of about 18,000 I.U. per lb. No significant difference was found, in areas where tested, between the average vitamin A potency of butter on retail markets and the average of the creamery butter produced in this country.<sup>31, 32</sup>

The average vitamin A potency of the fat in winter butter produced in the United States was about 30 I.U. per gm. and that of summer butter was 49 I.U. per gm. On this basis, the average vitamin A potency of milk containing 4 per cent of fat may be calculated to be 1,140 I.U. per qt. for winter milk and 1,800 for summer milk.<sup>31</sup> "There is ample experimental evidence that vitamin A potency of milk, and also of butter made from milk, can be readily changed by increasing or decreasing the quantity of carotene in the cow's ration—any condition which tends to increase the lushness of pasture or carotene content of winter fed forages—either silages or hays—will increase the vitamin A potency of milk and butter very much."<sup>31</sup>

*Storage*—Seven state experiment stations studied the effect of storage on the vitamin A potency of butter. Samples of butter were handled and stored under various practical conditions. The results indicate that both carotene and vitamin A are very stable in butter under the conditions tested; that little if

any loss of vitamin A potency occurs during the periods that commercial butter is ordinarily stored; and that, in so far as the effect of storage is concerned, one would not expect the average vitamin A potency of the butter sold on the retail markets in this country to be significantly different from the average of the creamery butter produced in the country as a whole.<sup>32</sup> "This must mean that the antioxidants which occur naturally in butter are exceedingly effective in preserving its vitamin A potency."<sup>32</sup>

*Other Conditions*—Vitamin A appears relatively stable when subjected to the usual processes in the handling of milk. There is no loss of vitamin A potency due either to exposure to sunlight or to ultra-violet light in producing vitamin D milk of 400 U.S.P. units potency.<sup>15</sup> No evidence was found in the literature of losses in vitamin A due either to the short-time-high-temperature pasteurization process or to the holding method. Likewise, there is no evidence of loss of vitamin A as a result of evaporating milk. One extensive study on spray dried whole milk indicated that if any loss occurred during manufacture it was less than 10 per cent.<sup>21</sup> The vitamin A content was maintained satisfactorily during storage. After 6 months' storage at room temperature, no detectable loss of vitamin A was found in inert-gas-packed powder and only about 6 per cent in air-packed powder. Powder held at 100° F. for 6 months was found to lose 10 to 15 per cent of its vitamin A value in inert-gas-packed powder and perhaps 30 per cent of its value in the powder packed in air.<sup>21</sup>

#### VITAMIN A IN CHEESE

*Processing*—Since most of the fat of the original milk is retained in cheese making, much of the fat soluble vitamin A should also be present in the finished product. One study reports the distribution of vitamin A potency

in Cheddar cheese making as follows: 85 per cent retained in the cheese, 7 per cent in the whey, 8 per cent unaccounted for. These figures apply to both carotene and vitamin A. The authors suggest that losses probably occurred in the adherence of milk fat to containers and equipment during processing.<sup>33</sup>

**Storage**—No losses were noted in vitamin A potency when Cheddar cheese was stored for nearly one year. The carotene content showed a slight increase while the vitamin A content was quite constant.<sup>33</sup>

In certain mold ripened cheeses, it appears possible that some synthesis of vitamin A takes place since food tables show vitamin A values higher than can be accounted for by the vitamin A found in the milk from which the cheeses originated. One experimental study on blue cheese indicates no change in its vitamin A value during aging.<sup>34</sup>

#### CAROTENE AND ICE CREAM

**Storage**—According to one study (quoted above under the discussion of riboflavin), ice cream showed a loss of carotene during storage which amounted to 15.7 per cent.<sup>26</sup>

#### SUMMARY

From the foregoing discussion it is evident that it is impossible to generalize on the all-round stability of the nutrients contained in dairy products as they are subjected to the varied conditions which prevail in the handling of the products from production to consumption. However, it is possible to indicate in broad terms the relative stability of specific nutrients. It may be stated, for example, that riboflavin is remarkably stable except when acted on by light; this photo-chemical reaction is accelerated by heat. Thiamin is somewhat less stable to heat than riboflavin but is not influenced by the light-heat combination. Neither the riboflavin nor the

thiamin content of milk is strongly affected by the feed of the cow. The vitamin A value of dairy products, on the other hand, depends to a great extent on the carotene content of the cow's ration; in general, however, it remains stable during ordinary processing and handling of the products.

#### REFERENCES

1. Johnson, P., Maynard, L. A., and Loosli, J. K. The Riboflavin Content of Milk as Influenced by Diet. *J. Dairy Sci.*, 24:57 (Jan.), 1941.
2. Holmes, A. D., Jones, C. P., and Wertz, A. W. Ascorbic Acid, Riboflavin and Thiamine Content of Cow's Milk—Influence of the Ration. *Am. J. Dis. Child.*, 67:376 (May), 1944.
3. Theophilus, D. R., and Stamberg, O. E. The Influence of Breed, Feed and Processing on the Riboflavin Content of Milk. *J. Dairy Sci.*, 28:259 (Apr.), 1945.
4. Holmes, A. D., and Holmes, J. O. Uniformity of Riboflavin Content of Milk Produced Under Standardized Conditions. *Am. J. Dis. Child.*, 66:607 (Dec.), 1943.
5. Lardinois, C. C., Mills, R. C., Elvehjem, C. A., and Hart, E. B. Rumen Synthesis of the Vitamin B Complex as Influenced by Ration Composition. *J. Dairy Sci.*, 27:579 (July), 1944.
6. Hunt, C. H., Kick, C. H., Burroughs, E. W., Bethke, R. M., Schalk, A. F., and Gerlaugh, P. Studies on Riboflavin and Thiamine in the Rumen Content of Cattle. *J. Nutrition*, 21:85 (Jan.), 1941.
7. Peterson, W. J., Haig, F. M., and Shaw, A. O. Destruction of Riboflavin in Milk by Sunlight. *J. Am. Chem. Soc.*, 66:662, 1944.
8. Holmes, A. D., and Jones, C. P. Effect of Sunshine Upon the Ascorbic Acid and Riboflavin Content of Milk. *J. Nutrition*, 29:201 (Mar. 10), 1945.
9. Ziegler, J. A. Photochemical Destruction of Vitamin B<sub>2</sub> in Milk. *J. Am. Chem. Soc.*, 66:1039, 1944.
10. Stamberg, O. E., and Theophilus, D. R. Loss of Riboflavin in Milk Due to Sunlight. *Milk Dealer* (May), 1944.
11. Stamberg, O. E., and Theophilus, D. R. Photolysis of Riboflavin in Milk. *J. Dairy Sci.*, 28:269 (Apr.), 1945.
12. Josephson, D. V., Burgwald, L. H., and Stoltz, R. B. The Effect of Route Delivery on the Flavor, Riboflavin and Ascorbic Acid Content of Milk. *J. Dairy Sci.*, 29:273 (May), 1946.
13. Shetlar, M. R., Shetlar, C. L., and Lyman, J. F. Determination of Riboflavin in Chocolate Milk and the Comparative Photochemical Losses of Riboflavin in Chocolate and Whole Milk. *J. Dairy Sci.*, 28:873 (Nov.), 1945.
14. Williams, R. R., and Cheldelin, V. H. Destruction of Riboflavin by Light. *Science*, 96:22 (July 3), 1942.
15. Fuhr, I., Dornbush, A. C., and Peterson, W. H. The Effect of Ultra-Violet Irradiation on the Vitamin A, Carotene and Riboflavin Content of Milk. *J. Dairy Sci.*, 26:643 (July), 1943.
16. Ziegler, J. A., and Keevil, N. B. Photochemical Destruction of Riboflavin in Milk and Losses During Processing. *J. Biol. Chem.*, 155:605 (Oct.), 1944.
17. Houston, J., Kon, S. K., and Thompson, S. Y. The Effect of Commercial Pasteurization and Sterili-



zation on the Vitamin B<sub>1</sub> and Riboflavin Content of Milk as Measured by Chemical Methods. *J. Dairy Research*, 11:67 (Jan.), 1940.

18. Holmes, A. D. Effect of Pasteurization on the Riboflavin Content of Milk. *J. Am. Dietet. A.*, 20: 226 (Apr.), 1944.

19. Holmes, A. D., Lindquist, H. G., Jones, C. P., and Wertz, A. W. The Effect of High-Temperature-Short-Time Pasteurization on the Ascorbic Acid, Riboflavin and Thiamine Content of Milk. *J. Dairy Sci.*, 28:29 (Jan.), 1945.

20. Henry, K. M., Houston, J., Kon, S. K., and Thompson, S. Y. The Effects of Commercial Processing and of Storage on Some Nutritive Properties of Milk. Comparison of Full-Cream Sweetened Condensed Milk and of Evaporated Milk with the Original Raw Milk. *J. Dairy Research*, 13:329 (Mar.), 1944.

21. Sharp, P. F., Shields, J. B., and Stewart, A. P. Nutritive Quality of Spray-Dried Whole Milk in Relation to Manufacture and Storage. *Proc. Inst. Food Tech.*, 1945, pp. 54-57.

22. Irvine, O. R., Bryant, L. R., Sproule, W. H., Jackson, S. H., Crook, A., and Johnstone, W. M. The Retention of Nutrients in Cheese Making. *Sci. Agr.*, 25:817, 833, 845 (Aug.), 1945.

23. Evans, E. V., Irvine, O. R., and Bryant, L. R. Thiamine in Cheddar Cheese Made from Raw and Pasteurized Milk. *J. Nutrition*, 32:227 (Sept.), 1946.

24. Dearden, D. V., Henry, K. M., Houston, J., Kon, S. K., and Thompson, S. Y. A Study of the Balance of Certain Milk Nutrients in the Making of Cheddar, Cheshire and Stilton Cheeses, and of Their Fate During the Ripening of the Cheeses. *J. Dairy Research*, 14:100, 1945.

25. Burkholder, P. R., Collier, J., and Moyer, D. Synthesis of Vitamins by Microorganisms in Relation to Vitamin Content of Fancy Cheeses. *Food Research*, 8:314 (July-Aug.), 1943.

26. Holmes, A. D., Kuzmeski, J. W., and Canavan,

F. T. Stability of Vitamins in Stored Ice Cream. *J. Am. Dietet. A.*, 22:670 (Aug.), 1946.

27. Kendall, N. Thiamine Content of Various Milks. *J. Pediat.*, 20:65 (Jan.), 1942.

28. Kon, S. K. The Chemical Composition and Nutritive Value of Milk and Milk Products. *Chem. & Ind.*, 62:478 (Dec. 18), 1943.

29. Kon, S. K. Relative Nutritive Value of Different Forms of Milk. *Nature*, 148:607 (Nov. 22), 1941.

30. Knott, E. M. Thiamine Content of Milk in Relation to Vitamin B<sub>1</sub> in Requirement of Infants. *A.J.P.H.*, 32:1013 (Sept.), 1942.

31. Vitamin A in Butter. U. S. Department of Agriculture: *Misc. Pub. No. 571* (July), 1945.

32. Cary, C. A., and Hartman, A. M. The Nutrients in Milk. Unpublished material.

33. Higuchi, K., Price, W. V., and Peterson, W. H. Relation of Corn and Alfalfa Silage to the Quality of Cheese and Its Carotene and Vitamin A Content. *J. Dairy Sci.*, 29:157 (Mar.), 1946.

34. Todhunter, E. N., Roderuck, C. E., and Golding, N. S. The Vitamin A Value of Roquefort Type Cheese. *J. Dairy Sci.*, 25:1023 (Dec.), 1942.

ETHEL A. MARTIN, *Chairman*

OSCAR BOISVERT

J. O. CLARKE

MARIETTA EICHELBERGER, PH.D.

EARL A. LOUDER, PH.D.

WILLIAM B. PALMER

LLOYD K. RIGGS, PH.D.

PAUL F. SHARP, PH.D.

PAUL H. TRACY, PH.D.

## Walter Reed Bust in the Hall of Fame

The American Society of Tropical Medicine is sponsoring a campaign for funds in order to have a bust of the late Dr. Walter Reed placed in the Hall of Fame. This niche has heretofore remained empty for lack of funds, although Dr. Reed was elected to the Hall of Fame in 1945. It is hoped to have the funds collected and the sculpture completed so that the dedication ceremonies may be part of the Inter-

national Congress for Tropical Medicine and Malaria to be held in Washington in the spring. The evening of May 12, 1948 has been set aside for the ceremony.

It is estimated that about \$6,000 will be needed. Contributions should be sent to Norman H. Topping, M.D., Secretary-Treasurer of the American Society of Tropical Medicine, National Institute of Health, Bethesda 14, Md.

# Recommended Procedure for the Bacteriological Examination of Shellfish and Shellfish Waters\*

## Laboratory Section

### INTRODUCTION

This report replaces the recommended methods of procedure for the bacteriological examination of shellfish and shellfish waters (A.P.H.A., 1943) and has been revised in accordance with the experience of the committee and others who have studied the procedure during the past three years. The committee consisted of: C. A. Perry (resigned); C. T. Butterfield, Leslie A. Sandholzer, Herman Sommer, F. W. Tanner, Cornelius B. Kelly, Charles E. Renn, and J. Gibbard, *Chairman*.

In general, the technique outlined for the bacteriological examination of shellfish is based on recognized procedures which have been developed for the examination of water and sewage. It should, however, be pointed out that there is some evidence not fully confirmed that some coliforms found in salt water may be of little sanitary significance. Furthermore, it is realized that the biology of some shellfish particularly in reference to their normal bacterial flora is not clearly understood. Despite this lack of data, there is every justification for the use of recognized bacteriological procedures for the determination of the coliform group of bacteria, for in the great majority of cases the sanitary engineer can demonstrate beyond doubt

that the presence of coliform organisms is directly related to pollution of human or animal origin.

In this revised procedure, the short methods previously suggested for estimating *Escherichia coli* have been eliminated as unsatisfactory. The chlorine rinse has also been dropped for the same reason. Methods for the examination of frozen shellfish and shellfish products have been included. Mechanical disintegrators have been recommended for preparing shellfish samples and the older procedure of cutting and shaking the shellfish has been discarded.

### Shellfish Defined

The term shellfish as herein used refers to any fresh or frozen edible bivalve mollusc, either shucked or in the shell and any fresh or frozen or incompletely sterilized products thereof.

### Coliform Group

For the purpose of examination of shellfish and shellfish waters, the coliform group shall be considered as including all organisms which, upon transfer from a positive presumptive test (gas-positive in lactose broth), show fermentation with gas formation in lactose medium containing 0.00133 per

\* Revision of Recommended Methods of Procedure. Report of the Standard Methods Committee. STANDARD METHODS COMMITTEE FOR THE EXAMINATION OF SHELLFISH Organized 1938. Published reports: Year Book 1941-1942, *A.J.P.H.*, May, 1943, Official Report of the A.P.H.A., pamphlet, 1944.

cent of brilliant green and 2.0 per cent of bile (brilliant green lactose bile broth).

In most cases, the determination of the coliform group will provide sufficient evidence as to the safety of the shellfish under consideration. However, laboratories charged with the responsibility of examining samples of shellfish other than those known to have been freshly taken from growing areas would be well advised to complete all tests for *Escherichia coli* according to the procedure recommended in the A.P.H.A. *Standard Methods for the Examination of Water and Sewage*, 9th Ed., under "Selective Agar Media for Differentiation," p. 227 and "Differentiation of Coliform Organisms," pp. 228-231. Such examinations may become the basis of legal action and complete tests are recommended.

#### I—BACTERIOLOGICAL EXAMINATION OF SHELLFISH WATERS

##### A—Collection and Transportation of Samples

Samples of water from shellfish areas shall be collected at various stages of the tide and shall also be collected at different depths if there is any indication of variations in salinity or pollution due to stratification. The samples shall be collected in sterile bottles and shall be fully protected against contamination both during sampling and after collection. They should be kept at a temperature at or below 10° C. (50° F.) and shall be examined as soon as possible after collection. The samples should preferably be tested within 12 hours from the time of collection and in no case shall samples which have been held for more than 30 hours be tested.

##### B—Field Record

A record of environmental conditions made at the time of collection of the

sample should accompany all water samples collected during the course of a survey to establish the sanitary condition of shellfish waters. This record shall include the following essential information:

- Date and hour of collection
- Exact location of the sampling station

Where possible the following supplementary data shall be obtained in order to interpret the bacteriological findings.

1. State of the tide
2. Direction and velocity of currents
3. Direction and velocity of the wind
4. Temperature and density of the water
5. Depth of the water and depth at which the sample was collected
6. Temperature of the air
7. Notes on any unusual conditions which may affect the sanitary quality of the water
8. Record of rainfall in the immediate past

A suitable form to be used for reporting this information may be found in Sec. IV A.

##### C—Procedure

Examination for bacteria of the coliform group shall be made by primary inoculation into plain lactose broth (see Sec. III D) with incubation at 35°–37° C. After incubation for not more than 48 hours definite gas formation shall be recognized by the presence of visible gas in the upper end of the inverted fermentation tube or by the presence of effervescent gas bubbles visible only when the tube is shaken.

Detailed instructions on the collection of samples and inoculation of media may be obtained from the A.P.H.A. *Standard Methods for the Examination of Water and Sewage*, 9th Ed., p. 190, et seq.

##### 1. Inoculation

###### Inoculate—

- a. Not less than 3 tubes with 10 ml. of undiluted water
- b. Not less than 3 tubes with 1 ml. of undiluted water

- c. Not less than 3 tubes with 1 ml. of a 1 in 10 dilution of water (in 1 per cent salt solution)

(These dilutions may be altered to suit the degree of contamination of the water, but in no case should less than three dilutions be inoculated.)

## 2. Presumptive Test for Coliform Organisms

Incubate tubes for 18–24 hours at 35°–37° C. Record gas formation in each tube.

a. *Gas present*—Any amount of definite gas constitutes presumptive evidence of the presence of coliform bacteria and must be confirmed as described in step 3 below.

b. *No gas*—Incubate negative tubes an additional 24 hours making a total of 48 hours incubation. Record gas formation.

(1) Gas present in any amount constitutes a doubtful test which must always be confirmed (step 3).

(2) Absence of any gas after 48 hours of incubation constitutes a final negative test.

## 3. Confirmation

All positive gas tubes must be confirmed for bacteria of the coliform group.

Transfer a loopful (3 mm. diameter loop) of culture from the gas-positive primary lactose broth fermentation tube to one of brilliant green lactose bile broth (see III E).

a. Any amount of definite gas formation within 48 hours at 35°–37° C. constitutes a positive test for bacteria of the coliform group.

b. Absence of gas after 48 hours' incubation constitutes a negative test for bacteria of the coliform group.

## 4. Differentiation of coliform organisms

Conduct all tests for relative density of species of the genera *Escherichia* and *Aerobacter* according to the procedures recommended in the A.P.H.A. *Standard Methods for the Examination of Water and Sewage*, 9th Ed., under "Selective Agar Media for Differentiation," p. 227

and "Differentiation of Coliform Organisms," pp. 228–231.

## D—Expression of Results

The numbers of bacteria of the coliform group shall be expressed as the most probable numbers (M.P.N.) per 100 ml. of sample. The M.P.N. shall be determined from the table of most probable numbers given in Sec. V.

## II—BACTERIOLOGICAL EXAMINATION OF SHELLFISH

### A—Collection and Transportation of Samples

Individual containers of shellfish samples shall be marked for identification and the same mark shall be placed in its proper place on the descriptive form which accompanies the sample.

Shellfish samples shall be kept at or below 10° C. (50° F.) until examined, but under no condition shall they be permitted to come in direct contact with ice. A sample shall be considered unsatisfactory which has been improperly handled after collection. Samples of shellfish should preferably be tested within 12 hours from the time of collection and in no case should they be examined if they have been held for more than 30 hours.

### Shell Stock

In general, ten or more shellfish, judged to be representative of the lot under examination shall be selected and prepared for transportation to the laboratory. Oysters and hard-shell clams (quahaugs) should have deep bowls, unbroken lips, and shells tightly closed. The quantity of shellfish submitted shall be sufficient to produce not less than 200 ml. of shell liquor and ground meats. The shellfish shall be placed in a suitable sterilized container such as a can with watertight lid or a canvas or waterproof bag. All shellfish for bacteriological examination shall be handled aseptically.

a. Gas present—Any amount of definite gas constitutes presumptive evidence of the presence of coliform bacteria and must be confirmed as described in step 3 below.

b. No gas—Incubate negative tubes an additional 24 hours making a total of 48 hours incubation. Record gas formation.

(1) Gas present in any amount constitutes a doubtful test which must always be confirmed (step 3).

(2) Absence of any gas after 48 hours of incubation constitutes a final negative test.

### 3. Confirmation

All gas-positive tubes must be confirmed for bacteria of the coliform group, as described under Section 3 in the procedure for the examination of shellfish waters, by transfer to brilliant green lactose bile broth.

### 4. Differentiation of Coliform Organisms

Tests for relative density of species of the genera *Escherichia* or *Aerobacter* shall be made by the method described in Section 4 in the procedure for the examination of shellfish waters. Any laboratory charged with the responsibility of examining shellfish and desirous of determining the relative density of the various members of the coliform group should adhere strictly to the prescribed procedure. Such examinations may become the basis of legal actions and short cuts are not recommended.

### E—Colony Counts

A standard colony count of shellfish samples has been found to be of value as an index of general sanitation and refrigeration.

Colony counts shall be made by inoculating various amounts of sample, as prepared under Section II—A, above, into the tryptone glucose extract agar (see Sec. III F) and incubating plates at 35°–37° C. for 48 hours.

The method of preparing plates and

making the counts shall be that recommended by the A.P.H.A. *Standard Methods for the Examination of Dairy Products*, except that milk shall not be added to the medium (*Standard Methods for the Examination of Dairy Products*, 8th Ed., 1941).

### F—Expression of Results

The numbers of bacteria of the coliform group shall be expressed as the most probable numbers (M.P.N.) per 100 ml. of sample. The M.P.N. shall be determined from the tables of most probable numbers (Sec. V).

## III—MEDIA—COMPOSITION AND PREPARATION

### A—Materials

The materials used for the preparation of media shall be as described in *Standard Methods for the Examination of Water and Sewage*, 9th Ed., p. 184.

### B—Adjustment of pH

The method of adjustment of reaction shall be as given in *Standard Methods for the Examination of Water and Sewage*, 9th Ed., p. 185.

### C—Sterilization

The method of sterilization of media shall be as given in *Standard Methods for the Examination of Water and Sewage*, 9th Ed., p. 185.

### D—Lactose Broth:

Beef Extract .....	3.0 gm.
Peptone .....	5.0 gm.
Lactose .....	5.0 gm.
Water (Distilled) ....	1 000.0 ml.

Adjust the reaction so that the pH after sterilization will be between 6.7 and 7.1. Place in fermentation tubes and sterilize in the autoclave at 15 lb. for 15 min. (121° C.). Cool rapidly after removal from the autoclave.

A 10 or 20 per cent solution of lactose in distilled water may be prepared and sterilized in the autoclave (15

lb. for 15 min., 121° C.), or by heating in an Arnold sterilizer at 100° C. for 1½ hours. Add this solution to sterile broth (without lactose) in amount sufficient to make an 0.5 per cent lactose solution, tube with proper precautions for preserving its sterility, and sterilize at 100° C. for 30 minutes.

It is permissible to add by means of a sterile pipette directly to a tube of sterile nutrient broth enough of the lactose solution to make the required 0.5 per cent concentration. The tubes so made shall be incubated at 35°–37° C. for 24 hours, as a test for sterility before they are used.

E—Brilliant Green Lactose Bile Broth  
(2 per cent)

Dissolve 10 gm. of peptone and 10 gm. of lactose in not more than 500 ml. of distilled water. Add 200 ml. of fresh ox bile or 20 gm. of dehydrated ox bile dissolved in 200 ml. of distilled water. No dehydrated ox bile shall be used which has a pH of less than 7.0. Make up with distilled water to a total of at least 975 ml. and adjust the reaction to pH 7.4. Add 13.3 ml. of a 0.1 per cent solution brilliant green (certified for culture media) in water;

make up to a total of 1,000 ml. and filter through cotton.

Distribute the medium in tubes provided with inverted vials. Sterilize in the autoclave at 15 lb. for 15 min. (121° C.).

The reaction after sterilization shall be not less than pH 7.1 and not more than pH 7.4.

F—Tryptone Glucose Extract Agar

	Per cent
Agar, best quality, not oven dried	1.5
Beef Extract .....	0.3
Tryptone .....	0.5
Glucose .....	0.1
Reaction—pH 6.6 to 7.0	

(The above media may be purchased in dehydrated form from firms of known reliability. The preparation of these media should conform to directions given above. Dehydrated media are recommended in the case of Eosin Methylene Blue Agar and Brilliant Green Lactose Bile Broth.

Large laboratories obliged to make their own media would be well advised to run comparative tests from time to time, using one of these well known commercial dehydrated products for the comparison.)

IV—FIELD RECORD FORMS

A—WATER FROM SHELLFISH AREAS  
DESCRIPTIVE DATA—WATER SAMPLES

Bay ..... Town ..... County ..... State ..... Date Coll. ....

Air Temp. .... Precipitation last 24 hours .....

Lab. No.	Sta. No.	Identification No.	Location	Time	Cur.		Tide	Wind		Water		Depth	
					Dir.	Vel.		Dir.	Vel.	Temp.	Sp. gr.	Water	Sampl.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

B—SHELLFISH FROM SHELLFISH AREAS

DESCRIPTIVE DATA—SHELLFISH SAMPLES FROM GROWING AREAS

Identification No. .... Date Collected ..... Time ..... Lab. No. ....  
Bay ..... Bed .....  
Location .....  
Town ..... County ..... State .....  
Type of Shellfish .....  
Condition of Tide ..... Water Temp. .... Sp. Gr. .... Depth .....  
Rainfall during last 48 hours .....  
Sources of pollution .....

Make careful notes on boats, weather, towns, privies, sewers, pasture lands, etc., which might be sources of pollution.

Collected by .....

C—SHELLFISH FROM PACKING PLANTS OR MARKETS

DESCRIPTIVE DATA—SHELLFISH SAMPLES—FROM PACKING PLANTS OR MARKETS

Identification No. .... Date Collected ..... Time ..... Lab. No. ....  
Place ..... No. ....  
Type of Shellfish .....  
Collected from .....  
Bed No. .... Bay ..... Owned by .....  
Dug by ..... No. .... Date .....  
Shipped by ..... No. .... Date .....  
Reshipped by ..... No. .... Date .....

Was the shellfish stored under proper sanitary conditions .....

Was the shellfish properly refrigerated ..... Temp. ....

Are there any other possible causes of contamination .....

Was the sample collected from a previously unopened container .....

Notes:

Collected by .....

V—TABLES OF MOST PROBABLE NUMBERS

- A—3 Tubes
- B—5 Tubes

VI—DEFINITIONS

1. Shellfish

The term shellfish as herein used refers to any fresh or frozen edible bivalve mollusc, either shucked or in the shell and any fresh or frozen or incompletely sterilized products thereof.

2. Coliform Group

For the purpose of examination of

shellfish and shellfish waters, the coliform group shall be considered as including all organisms which, upon transfer from a positive presumptive test (gas-positive in lactose broth), show fermentation with gas formation in lactose medium containing 0.00133 per cent of brilliant green and 2.0 per cent of bile (brilliant green lactose bile broth).

APPENDIX I

The Letsch oyster opener has been found useful for those who are inexperienced in opening oysters. It is essentially a heavy oyster knife powered

by a rack and pinion which forces the knife through the hinge of the oyster, severing the adductor muscle from its attachment to the top shell. The oyster may then be held by the bottom shell over the pint jar, the shell liquor drained and the bottom adductor muscle cut. The parts of the machine which come in contact with the oyster may be sterilized by flaming or immersing in 70 per cent ethyl alcohol or boiling water.

#### APPENDIX II

Disintegrators — The disintegrators mentioned in Section II C 1 c, page 1125, consist of the base housing a high speed motor (10,000–16,000 r.p.m.) which drives knives fitted in a cup which is placed on the top of the motor unit. These disintegrators are in production by a number of manufacturers and may be obtained from almost any laboratory supply house.

A metal cup, preferably of stainless steel or aluminum, has advantages over the glass cups usually furnished with the machine, particularly with regard to sterilization either in the autoclave or by boiling. These also may be obtained from the laboratory supply houses.

Experience with the particular make of disintegrator will dictate final establishment of grinding time. Care should be taken to avoid too long a grinding because of the danger of occlusion of excessive amounts of air in the mixture.

JAMES GIBBARD, *Chairman*

CHESTER T. BUTTERFIELD

ALBERT C. HUNTER, PH.D.\*

C. B. KELLY, JR.

C. A. PERRY, Sc.D.

LESLIE A. SANDHOLZER, PH.D.

HERMAN SOMMER, PH.D.

F. W. TANNER, PH.D.

CHARLES E. RENN, PH.D

---

\* Deceased



# Is Aviation Medicine Industrial Hygiene?\*

BRIG. GEN. EUGEN G. REINARTZ, M.D., F.A.C.P., F.A.M.

*U. S. Army (Ret.), San Mateo, Calif.*

FOR the past century efforts have been made to bring the problems of industry, the knowledge of medicine and related sciences together for the solution of these, in the interests of both the industry, as a whole, and those individuals participating in industry.

During the period 1840-1880 attempts were made to better the lot of the working man; however, after that time stress was laid on disease prevention, *per se*, and the working man, as an individual, relegated to a secondary role. During World War I the pendulum swung from particularized disease prevention to industry as a whole. It was during this time that a system of medicine was inaugurated in the Aviation Section of the Army Signal Corps that is now called "Aviation Medicine." It was a radical departure from any previous effort of similar nature. This system was developed in 1918 for the then newly-born Air Service of the Army and has gradually developed to encompass the entire field of aviation, civil, civilian governmental agencies, and the armed services.

A small band of inspired doctors under the competent leadership of Brigadier General Theodore Lyster formulated plans for the care and treatment of aviators. They were wiser than their generation, for in my opinion no similar

effort of like nature had been developed in any field of endeavor. It was the beginning, on a national scale, for the first time, of a system of medicine that would encompass the entire activities of personnel engaged in one of the arts—the art of flying.

This group of men were believed visionary and had to weather the rebuffs and hostility of those for whom they were laboring so conscientiously and intensely. They were determined in their convictions and were able to organize a research laboratory and a school for the indoctrination of others who had the temerity to follow where they had dared to pioneer.

Through the years between World War I and World War II this school—the School of Aviation Medicine, now located at Randolph Field—continued through its graduates to spread the leaven of the necessity for medical supervision over those who would learn to fly and those who had finished their training and had received their coveted aeronautical ratings. This indoctrination of Air Forces personnel early was an uphill battle and brought with it many disheartening experiences. To those of us who pioneered in this work it seemed at times that the "game was not worth the candle" and that we were "voices crying in the wilderness" of prejudice and antagonism—as is always the situation when one dares to institute an innovation, even though it is in what, at the time, and at a later date is proved to be, the best interests of the ones who

\* Presented before the Industrial Hygiene Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 13, 1946.

were its most vociferous opponents. In this uphill struggle for the recognition of Aviation Medicine, resistance came from an unexpected quarter in that we were oftentimes opposed by our own medical brethren of the Medical Department assigned to other duties than with the Air Forces. Nevertheless, Aviation Medicine being solidly founded developed and in the Services came to full fruition during World War II.

With the formation of the Division of Aeronautics in the Department of Commerce, the first director wisely ruled that the division should have a medical department. The doctors assigned to these duties were graduate flight surgeons and indoctrinated in this work in the Army. They formulated rules and regulations patterned after those of the Army but modified to meet the needs of a civilian population learning to fly but who could not be supervised as were Army personnel.

As civil airlines began to develop, the management of these lines soon realized that medical supervision of their flying personnel was a "must" if their operations were to be successful, from the standpoint of the health of the pilots as well as that of the public that had every right to demand the ultimate for the pilots' medical care. This has paid dividends, as I know of no airline—passenger or freight—that does not have its own thoroughly organized medical department with flight surgeons to look after the especial needs of their flying personnel.

Airplane manufacturers, too, have realized the necessity for and the effectiveness of aviation medicine in connection with those engaged in flying. These large plants have their regular medical establishments to care for the needs of their employees. However, they also have doctors who have had specialized training in those problems that beset flyers—especially those engaged in test flying new types of airplanes.

Aviation Medicine is medicine, in all its phases, applied to the art or profession of flying. In its application it transcends occupational medicine and industrial hygiene, as practised. Aviation Medicine has a higher significance than these, in that it encompasses both and goes farther, considering as it does the total personality of the flyer in any and all of the environments in which he finds himself, in the air, on the ground, at work, at play, and in his relaxations. It is a full-time job and those engaged in Aviation Medicine must be especially chosen, as not everyone who would practise this type of medicine is qualified for it.

At the Schools of Aviation Medicine of both the Army and the Navy—the only organized schools in the world giving formalized training in this specialty—emphasis is laid on the selection of doctors who would become flight surgeons. This selection is made academically, militarily, physically, and psychologically. I have for years defined the flight surgeon as an outstanding doctor, a graduate of the School of Aviation Medicine who has the attributes of the family physician, lawyer, and priest, with a strong bent for psychopathological medicine. During the past war it has been necessary for me to add the term "technologist" to my definition, because of the tremendous technological advances made in aviation, and concerning which the flight surgeon must know much.

The Schools of Aviation Medicine mentioned are supplemented by their own well organized research laboratories as well as by the Aero Medical Laboratories at Wright Field, Ohio, and Bethesda, Md. In the field of civilian aviation each large airline and airplane manufacturer has its own aviation medical research laboratory. These all have for their goal the solution of many problems from the human standpoint with which the profession is faced, as

aviation approaches the era of supersonic speeds, illimitable altitudes and interplanetary communication that staggers the imagination.

It might be well to detail how the flight surgeon works in this system of medicine and how it is applied in the Military Services. Prior to World War II all medical officers assigned to Air Forces duty were flight surgeons. However, with the tremendous expansion of aviation during the past six years such assignment was not possible. Nevertheless, over 5,000 doctors, thoroughly indoctrinated in Aviation Medicine, were added to the Armed Forces during this period. It is the hope, in the Army Air Forces certainly, that with the cessation of hostilities, all doctors assigned to duty with flying personnel will again be thoroughly versed in the problems of aviation by having attended the service schools and having received the required designation of flight surgeon.

In the Services the application of Aviation Medicine brings it into contact with the cadet applicant immediately upon his presenting himself for the purpose of pursuing flying training. From that time on, throughout his flying life, he is never outside its beneficent scope. During his training period he is continually under observation as to his physical well-being and, more especially, as to how he is adapting himself psychologically to the flood of new sensations and situations that he is experiencing in an effort to help him over these early hurdles of his flying life.

After the cadet has earned his wings and passes on to his transitional training period, a period fraught with many dangers, since at this stage he may think himself invincible in a plane, he may do something foolish that may lead to disaster. Having weathered this period the young man is then detailed to an operational unit. Here he becomes a part of an air crew and, depending on his assignment, he may be sent into any

part of the world. The flight surgeon is always at his side ready with advice, counsel, and indoctrination to make the air crewman's life more livable in several senses of that term.

If assigned in the Arctic his flight surgeon will give him instructions, to refresh his memory, relevant to the medical aspects of flying generally but specifically how to use protective clothing, warning him at the same time against such hazards as excessive perspiration in sub-zero weather. He is taught how to survive should he be forced down on snow or ice; how to use his emergency communications set, and how to use his parachute silk for protection and the building of temporary shelter. Instructions in the use of such other emergency equipment—fire making, fishing, snaring, hunting, etc.—are given and all emergency equipment furnished. The deleterious effects of glare from the snow, ice, and sea are brought to his attention, and goggles of an appropriate color are supplied. One of the flight surgeon's most difficult indoctrinations of flying personnel in these regions is the combating of lonesomeness, especially during the long winter night when monotony and boredom grip the entire command.

If the airman is assigned to duty in the tropics protection against the sun is stressed, again with reference to clothing and general bodily protection. The necessity of protection against tropical diseases, insect bites, and the use of prophylactic drugs is continually dinned into his ears. The taking of these drugs is a medically supervised procedure and statistics of the last war have proved how effective this was.

Instructions were and are now given airmen on how to survive in the jungle. Here too emergency equipment is furnished those who might suffer such a devastating experience, this included, in addition to the usual survival equipment, mosquito bars, and a particular-

ized emergency ration. Instructions are also given in the recognition and protection against venomous reptiles, the effect of enervating heat, and conservation of strength, the necessity of using salt and, as always, the psychological effect of such an experience.

Ditching procedures for various types of aircraft, as each has peculiar characteristics in this emergency, were first worked out by our British allies. When it became necessary for our Air Forces to know something about such techniques the same were worked out under the supervision of The Air Surgeon of our forces. When our airmen "ditched" it became necessary to rescue them, and this brought with it "air-sea rescue." Such air-sea rescue was drilled into flying personnel, not only those who might have to be rescued but to rescuing crews as well. The daring rescues, at times from under the very eyes of the enemy, make one of the most thrilling and hair raising records of the late war.

Instructions in first aid to the injured is of paramount importance, for where is such knowledge more needed than in a bomber engaged in aerial combat, with a crew of from two to ten, some of whom may be seriously wounded or unconscious from anoxia, many miles and hours from its home base.

During active operations the real flight surgeon saw his men prior to the "take off," giving each one a last critical survey to see that each man was fit for the hazardous mission he was about to begin. Upon the return of the flight this same flight surgeon, after having "sweated out" the intervening period, was ready and waiting on the landing strip to care for those who were in need of his professional ministrations and to give a welcome to those who had returned unharmed.

Many a heart-warming tale is told with pride by returned air veterans of how their "Doc" was always on hand and how they had learned to look for

his cheery, confident face immediately upon landing.

The flight surgeon, who is a flight surgeon in fact, is one of the greatest morale builders in any Air Forces outfit. He is continually consulted by the Commanding Officer and has direct entree to his office. I am informed that this same procedure is in vogue among the larger airlines, where the senior aviation physician has a direct approach to the president of the company. It must be so, for how could the medical officer or the senior physician discuss with any one but the "tops" the oft intimate problems brought to him by the flying personnel of his group!

Aside from those factors that are primarily due to war and the assignment to strange parts of the globe by reason of such war, the flight surgeon has many other things concerning which he must indoctrinate his air crew members. The matters concerning which I shall now speak are those factors that are inherent in flying itself and that have their effect upon all personnel who participate in powered aerial flight. It is in connection with these conditions that the flight surgeon's knowledge of technological matters is called upon, and he must work in close harmony with aeronautical engineers and others of the engineering profession for the solution of the many problems yet unanswered.

Some airplanes, even of the present, have been developed by aeronautical designers and engineers to such an extent that the human economy, not being adaptable to similar developmental changes, has lagged behind. The limitation of the human body with its finite characteristics must be brought to the attention of the designers and engineers so that adaptive measures for their proper human manipulation may be developed. Whose responsibility should this be but that of the medical man versed in the physiological and psychological problems of aviation?

The effect of decreased atmospheric pressure as one rises to altitude affects all living organisms. Altitudes may be reached in which this factor alone may cause death. The engineer in designing an airplane is interested abstractly in developing a machine that will attain a certain altitude. The flight surgeon, however, visualizes the individual who will be called upon to handle the controls and be a functioning organism when the engineer's maximum altitude is reached. His advice to the engineer is pressurization which on consultation is determined upon. The next question that then arises is "How much of a shock can the human economy tolerate in the case of explosive decompression?" Here again the answer is forthcoming from the flight surgeon by reason of the physiologic experimentation done in the laboratory. This question has assumed great practical importance in commercial aviation as airlines are now projecting transcontinental flights at an altitude of 40,000 ft., where the atmospheric pressure is reduced to 2.72 lbs. per sq. in. Flight surgeons have been asked to express an opinion as to how much pressurization should be used. The optimum, of course, would be sea level pressures of 14.6 lbs. per sq. in., but these the engineers believe too sanguine, from the standpoint of engineering. Some compromise is being arrived at, so that all passengers may fly at a pressurized altitude that is compatible with good engineering practices, safety, and comfort.

Another and more pronounced altitude effect is the diminution in the partial pressure of oxygen. But few are able to maintain normal functioning, by reason of anoxia, above 18,000 feet, and none can function without supplemental oxygen at the height of Mt. Everest. "Bends" and "Chokes," the symptoms of anoxia, have been known by the flight surgeon for years. It was through his efforts, again in consultation with

engineers, that a suitable oxygen mask was developed. During the past war when at extreme operational altitudes the oxygen mask froze, it was the experimental work done by flight surgeons, working first in the theater, that brought about an improvement in this apparatus with a most gratifying decrease in the number of disabilities due to anoxia as a result of frozen masks.

The type of clothing worn by aviators to protect them from the extreme cold, another of the disabling factors encountered at altitudes, had its modest beginnings in the research made by a flight surgeon working obscurely in the wilds of Alaska. This has now progressed to the point of electrically heated clothing, as well as other types, so that comfort and protection may be had under any of the vagaries of climate encountered.

The illusions of the senses as related to the internal ear that caused so many deaths by crashing in the fatal "spin," were elucidated by a flight surgeon in 1928. His clear exposition and interpretation of the illusions were the basis for the development of instruments that have made instrument flight possible and without which no long distant flight could possibly be made.

The success in the transportation of sick and wounded during the last war is a great tribute to the flight surgeons, who for more than 25 years have urged this mode of transportation of patients as being practicable, feasible, humanitarian, and life saving.

So it is that whether one be speaking of the subjects already discussed or the effects of vibration from the newly developed jet plane, or noise, or speed, or noxious gases, one finds the flight surgeon deeply engrossed in study in his laboratories to assist the engineers in the elucidation of the problems as they affect not only the flyer, but everyone whom they might harm.

It is worthy to note that modern application of an ancient protective device

—the body armor—was the development of a flight surgeon, who, working almost alone and against great odds, was able to have aircrews volunteer to wear his device. It was but a short time following the survival of one, who surely would have been killed, that the "flack suit" was demanded by many. The numbers of those wearing this garment, who have been saved from certain death, is legion.

With the tremendous increase in the speed of airplanes the question of the safety of the pilot, in a pursuit plane particularly, should anything occur to render it unmanageable, immediately presents itself. It is at once apparent that the human body cannot tolerate air pressures developed at speeds such as are possible even today. Some means of getting the pilot out of the plane had to be developed. Ejection, therefore, had to be considered. This is not a new principle. Ejection seats were developed by the German Air Force and are being improved by us, through consultations and experimentation between our engineers and flight surgeons. It will be necessary to eject the pilot, in a capsule, which when slowing down will enable the pilot automatically to rid himself of the capsule and permit the use of his parachute.

Again in the matter of speed what will happen to the human economy when supersonic speeds are reached? The engineer is unable at this time to predicate what will happen to the structure of the airplane and we are at a loss to know, as yet, what will happen to the individual flying this plane. Can it be possible that the airplane, as now constructed, with its human cargo, will, as one engineer expressed it to me "hit a solid wall"? The supersonic "wall" has not yet been broken through and that which lies just before it and just beyond it is an unknown quantity of the utmost magnitude and will tax the acumen of all who work on this baffling problem.

Researches are now being made by aviation medical experts into the effects of cosmic rays on flying personnel because of the heretofore unbelievable altitudes to which airplanes will ascend within the immediately foreseeable future.

One of the greatest differences between Aviation Medicine and that which is known as occupational medicine or industrial hygiene lies in the stressing in Aviation Medicine of the psychological reactions of those who come under its authority. Aviation Medicine considers the individual not only as a single functioning organism in a profession, but as a total integrated personality. The stresses and strains of military and airline flying, to say nothing of the hazards of battle flying, as practised and envisioned in the future, are such as to produce personality difficulties in those less well integrated than are their fellows. The flight surgeon must be ever on the alert to catch those subtle changes and recommend remedial measures. This phase of his work in my opinion is one of the most important, of his duties.

Much has been written here concerning a relatively new system of medicine having its world-wide application to the problems of aviation. The question naturally arises as to how successful is such a system of medicine in accomplishing that which it has set for itself. The answer is immediately at hand, as it has been reported to me by a reliable informant that Messerschmitt, the famous German airplane designer, after his capture, made the statement to my informant that the American aircrewman knew more concerning aviation medical matters and was better indoctrinated in how to care for himself than were even the German physicians assigned to aviation duty.

The situation, in connection with Aviation Medicine, in an organized body as the Air Forces, is ideal for the de-

velopment of a system of medicine such as has been outlined. There are those who will state that such practices as outlined cannot be carried out in civil pursuits, and yet it is working in civilian aviation. Certainly civil aviation does not have the control over its personnel that is exercised by the Services. Granted that the principles enunciated are not as fully applicable in all phases, nevertheless in civil aviation, as in the Air Forces, there is a parallelism in this respect that is splendid and augurs well for the future of the flying profession.

It must be remembered, too, that while the flight surgeon gave original impetus to aviation medicine, the effects of which have spread beyond the boundaries of the Services, many of the advances that have been described have been made through the agencies of civilian laboratories.

It has been my pleasure to enumerate to you some of the specific ways in

which we who practise Aviation Medicine consider our work. There are many facets of this rapidly developing art that, because of the limitations of time, cannot be touched upon. Suffice it to say that there is no phase of a flyer's life or activity in which the flight surgeon does not have a deep and abiding interest and concern.

The answer to the question put to me "Is Aviation Medicine Industrial Hygiene?" may be answered in the affirmative with "Yes, it is industrial hygiene and more" since it goes further, and in my opinion, is broader in its concepts and certainly in its practices than is industrial hygiene.

There is much that industry at large may learn from the flight surgeon. Therefore, the principles and practices of Aviation Medicine, its ulterior motives being understood, may well be used as a pattern in the solution of the medical problems in industry.

# Program Audit—A Device for Reflecting Public Health Performance\*

EVELYN FLOOK AND JOSEPH W. MOUNTIN, M.D., F.A.P.H.A.

*Methods Examiner, and Medical Director, U. S. Public Health Service,  
Washington, D. C.*

ALL persons concerned with public health administration must have become disturbed about the increasing volume and complexity of reports and records that characterize our routine operations. Paper work in public health has long since passed the stage of being a source of irritation; it now constitutes a significant drain on the time of professional and technical personnel and thus has become an appreciable item in health department budgets. Part of the need for records arises out of the numerous occasions the primary worker will have for examining change in a case or situation under observation or for influencing a course of action. In greater measure it would seem that the requirements for both records and reports are determined by persons in supervisory positions and by agencies that administer grants-in-aid either financial assistance or technical services, in lieu of money grants. Clear-cut administrative reasons for these latter requirements in particular are always difficult and often impossible to elicit, much less justify.

It is traditional among our citizens to blame their government for most of their grievances, either real or imaginary, and for one layer of government to pass the blame on to another. Because the authors happen to be situated at the federal end of the line,

we could choose between only two courses—either reverse the process of fault finding, or accept the task of doing our part in trying to correct a situation which, we think, all agree is becoming truly serious. The latter course of action was chosen. Our methods and observations are presented with the conviction that they are timely and of general application in public health practice.

Those of you who occupy administrative positions in state health departments will recall that three years ago the authors began the collection of information on which to revise the requirements of the U. S. Public Health Service for the plan of organization and operation which a state submits annually in justification of federal funds for general public health purposes. On the basis of observations and in consultation with division directors in state health departments, a new type of plan was developed and has since been placed in general use, after clearance with the Committee on Business Management of the State and Territorial Health Officers. Although somewhat of a digression, a very brief description of the plan seems in order at this point, since it sets the stage for the audit procedure which completes the system of controls.

The plan submitted prior to the beginning of a fiscal year sets forth the funds that are available locally for support of the program, together with those that are contemplated from other sources. In so far as practicable, funds are assigned to specific functions. In

\* Presented before the Health Officers Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 13, 1946.



like manner, the staff is described by numbers in professional categories and according to functional assignment, wherever this is possible. There is also a statement of facilities operated by the department and the services associated with them. Each significant function of the department is then depicted by indicating—after a series of descriptive phrases—whether the activity is represented in the program and, if so, whether it is a major or minor item. By using an appropriate symbol, the reporting officer indicates whether there has been increase or decrease in the activity as compared with the previous year, and whether he plans to expand, contract, or maintain about the same level of operation in the ensuing year. After review and acceptance, this plan constitutes an agreement between the U. S. Public Health Service and the state health department concerned. Now the question is: how to determine later whether the grantee—in this case the state health department—has carried out the terms of the trust. In other words, what criteria shall be used in assaying performance or in measuring progress or retrogression?

It did not seem feasible to adapt the traditional quantitative expression of activities to our needs without falling back into the very fault we were trying to correct—the accumulation of voluminous statistical data. Substitution of professional judgment for a mass of uninterpreted figures appeared to be a more reliable means of determining what really makes a program “tick.” We decided, therefore, to explore another technique in which we would apply to program operation the principle of “audit”—meaning, according to Webster “to examine and verify.” The purpose of this exploration was to determine how the audit procedure might be adapted to a simplified set of requirements in public health administration. In this paper please keep in mind

the words: “*A simplified set of requirements in public health administration*” because what we propose is not geared to epidemiology, administrative research, or any other requirement beyond that of enabling a grant-in-aid agency to determine whether the aided program has been pursued effectively in accordance with the approved plan. Neither records of population experiences nor those used for internal administration and self-evaluation of health department services are involved in this discussion.

According to the traditional philosophy underlying grants-in-aid in the field of public health, primary responsibility rests with the grantee—not the grantor—for the development of programs. This, of course, must be done within a framework of reference that is determined by the legislative act or trust under which the funds are made available. Beyond the original understanding, which an approval of plan signifies, the operator of a program should be free to work out his own procedures. Acceptance of a grant carries with it responsibility for achieving reasonable accomplishments and for observing the dictates of good administrative practices, including ordinary fiscal honesty. At the same time, those who represent sources of funds need to obtain general understanding of those programs, to determine whether they are operating according to covenants, and to appraise results in relation to expenditures. With these general principles there is common agreement, but their application has given rise to a very cumbersome system of records and reports for which we now propose a simpler system of program audits.

The audit device is not presented here as a perfected instrument for solving the administrative problem of relating actual performance to plans previously agreed upon. Since there is still much to be done in its development, you may regard this discussion as somewhat premature.

On the contrary, your consideration of the subject has purposely been invited at this stage so that there might be more general understanding of our objectives. Because health officers have a mutual interest in this problem, it is hoped they will contribute to our thinking and efforts in this direction before a fixed procedure has evolved.

The underlying principle of program audit is field observation of actual operations by persons of experience and judgment, and heart to heart—or at least, face to face—discussion between representatives of the supporting agency and of the operating agency. Through such observations and discussions more intimate knowledge concerning a program can be gained in a day or two than through weeks of study of summary activity reports. Program audit has the added advantage of combining consultation with appraisal under circumstances which can be made as informal as the occasion warrants.

For instance, traditional reports on clinic activities usually call for the total number of persons, by prescribed classifications, that have been served over a given period, together with counts of persons disposed of in several significant fashions. True, some idea of the general effectiveness of the program and of its accomplishments could be derived from such data, but much, if not all, of its value is lost in the routine tabulations that are generally made. The authors maintain that a personal visit to a random sample of these clinics would reveal a great deal more. Spot review of the operating case records taken directly from the clinic file would give all information contained on a periodic report especially prepared for submission to a supporting agency and requiring hours of time both in preparation and review. In addition, it would be possible to determine at first hand whether the case load of the clinic justifies its operation; whether it is accessibly located; whether

the clinic hours are convenient for the patients to be served; how well the session is organized; whether it is conducted with due regard for the patients' feelings—causing them a minimum of discomfort and embarrassment; whether waiting, interviewing and treatment rooms are comfortable and well arranged; whether interviewing is skillfully done; whether equipment is sufficient and well cared for; whether there is an adequate staff of properly qualified personnel in attendance; and whether acceptable diagnostic and treatment procedures are used. In other words, by actual observation a competent surveyor can differentiate between good and poor performance in a way that it is not possible to express statistically.

Consequently, the thesis that intelligent consultants in the several fields of public health quickly develop reliable impressions of people, equipment, and character of service, that are more revealing than any quantitative enumeration of activity, is the primary base upon which the scheme of program audit is founded. On the other hand, a *completely* unguided series of observations, made by a number of different persons cannot be trusted entirely to elicit a comparable body of information.

While the expert apparently is able to form an opinion concerning a situation at a glance, an uninitiated person goes through a ponderous process of weighing every element of a program before reaching a conclusion. However, if you pin the expert down, you will find that—unknown to himself, perhaps—he, too, applies certain criteria in arriving at his conclusions. In short, for program audit, professional judgment of a program must be tied to a real system of observations and follow a defined method of approach. We have consulted with numerous specialists in the various health fields for the purpose of learning the particular points on which judgment

should be based, thus minimizing the chance of personal bias being mistaken for sound professional judgment.

Prior to visiting the state to begin work on the audit—proper, preliminary study is made of commitments in the plan, particularly those concerned with funds, staff, equipment, and service items that the respective programs comprise.

From this preliminary synopsis the program auditor—always a technically trained person and usually a specialist in the particular field under study—forms an idea of what he expects to find when he reaches the scene of operation with respect to the general appropriateness of resources and methods of operation and of how these elements fit together. These impressions will be confirmed, modified, or completely refuted by the situation he actually finds during his visits. Explanation regarding questionable situations suggested by this preliminary study, as well as verification of approved situations, will be obtained in the field.

When the program auditor visits the area he first determines whether there are any peculiar problems that materially affect the program under scrutiny, whether such problems are susceptible to solution, and if so, whether reasonable effort is being made to get them solved. With this knowledge to serve as a guide, he proceeds to make observations that will reveal how the program is actually operating, reasons for any weaknesses that he finds, and conditions contributing to outstanding accomplishments. Conclusions concerning the *quality* of services rendered are based on several approaches: Well formulated questions designed to reveal the knowledge, attitudes, and skills of the operating staff with respect to the various elements of the program; field visits with staff members for observation of the techniques in use and reaction of persons served; spot check of operating

records to determine actual accomplishments in the most significant aspects of the program; examination of the educational materials used; and determination of methods employed by the operating agency for evaluation of the effectiveness of the program as a whole or of any particular component element. From his spot check of service records the auditor determines also the coverage of services rendered—in terms of geographic area and population reached and in terms of essential items included. He observes economy of operations; adequacy and arrangement of quarters, equipment, and supplies; general morale of the staff; progress toward accomplishing objectives; staff advancement; and improvement of program. As observations are made from time to time throughout the year the consultant makes notes of his findings for later reference. At the end of each visit he records on a report sheet designed for the purpose pertinent comments regarding each observation. On a predetermined date, reports of the several consultants—containing the brief, concise statements that have been entered cumulatively—are summarized into an overall audit report for the health department as a whole.

Although the types of observations are stated here in very general terms, we have systematized the procedure to be followed by preparing for the use of all program auditors an outline that is used as a guide in performing the audit. Usually casual questioning will lead to the selection of sample records or current situations for careful checking. Where counts are necessary, these can be made from regular operating records. *No documents beyond ordinary records for internal operation of the health department need be kept for supplying information necessary for grant-in-aid administration when a procedure similar to that described is followed.* Furthermore, some account is taken of person-

nel. It may be almost axiomatic that with the right kind of people on the job—people of competence and integrity, in reasonable numbers, having sufficiently varying professional backgrounds and adequate equipment with which to work—then a creditable performance can be assumed with a reasonable degree of confidence. However, to assure oneself on this point, he must begin by examining into the qualifications of the staff, but more especially into the personnel practices of the department under audit. In this way, he can determine whether the type of performance disclosed by the audit of service is likely to continue.

Throughout the auditing procedure, which should be integrated with regular consultation visits during the year rather than scheduled as a separate independent procedure, rapport is developed between the surveyor and the organization under review for, by this arrangement, the questioning which takes place is not a form of catechism but entirely a give-and-take discussion—a technique which engenders and fosters the spirit of coöperative endeavor.

At this point we are satisfied that, program audit will more nearly meet our needs than any scheme we have yet tried, and there is strong basis for feeling that state health agencies in turn can use it for reducing some of their present reporting requirements of local health units. Any records that are being kept locally for the sole purpose of accumulating information to be reported to someone else—whether a state or federal agency—should be scrutinized with a view to being eliminated. In all probability, if state personnel periodically audited programs according to the method which we have roughly outlined, they too, would be much better informed regarding those programs than when they rely upon reported statistics. Local health officers, as well, might advantageously utilize a similar technique

in checking the performance of the various members of their operating staffs.

By way of summary, may we repeat just two points which we hope have been made perfectly clear: First, program audit is not an instrument for research. From the plan, which must be approved before any funds are authorized, it must be decided whether the program is fairly well conceived. A program audit is designed merely to show whether the plan is being carried out faithfully and with a *reasonable degree of effectiveness*. On the basis of facts revealed by a program audit we believe that it is possible to judge accurately enough whether a program is static, going backward, or forward. Research is another matter, and usually has a set of requirements all its own. While it is recognized that important information of research value may be obtained from routine administrative records, generally speaking, research should be set up as a special project, circumscribed in scope and—for the most part—allowed to continue during only a limited period of time. No system of everyday operations should be loaded down with requirements keyed to research purposes.

Second, true knowledge of an operating program cannot be gained by a person at a distance in his own office. Statements in defense of any system of records and reports that indicate it can be done are apt to be misleading; furthermore, such practice is detrimental to good relationship between supporting and operating agencies. Perhaps the chief advantage of program audit is the fact that it provides an opportunity for representatives of these two positions to meet each other face to face at the scene of action.

In conclusion, let us look to the future. Although programs of health departments are still of limited scope, there has already evolved an extremely

complex scheme of records and reports. Not only does it consume the full time of a clerical force nearly one-fifth as large as the total complement of health workers, but also, in some instances, it demands as much as one-third of the effective working time of professional groups. This situation becomes truly alarming as we envisage the future,

which promises to bring in a multiplicity of new programs containing an infinite variety of personal services. As these "coming events cast their shadows before them" it becomes imperative that some sort of simplified administrative procedure be substituted for detailed reports. To meet this need, we offer you program audit.

# The Evaluation of Local Health Work\*

ROSCOE P. KANDLE, M.D., M.P.H., F.A.P.H.A.

*Director, Bureau of Preventable Diseases, State Department of Health,  
Trenton, N. J.*

THE development of local health services so far and that proceeding under the stimulus of the Subcommittee on Local Health Units makes evaluation an urgent requirement. We need to know how well we have done the job so far. We must know that new units are being soundly developed. We must know that the scarce personnel now available are performing activities which are actually effective and efficient. This is the major responsibility of local health officers, directors of the division of local health services, and of state health officers.

Evaluation is a very broad field. It means stock-taking of resources, personnel, and efforts. It requires an analysis of problems and how well they are being met with the machinery available. Also, it must ask, as Dr. Allen Freeman frequently does, "How much does it cost?" It includes the knowledge of all the community efforts in the public health field and critical study of how well they are integrated or correlated. It is essential to intelligent program planning. It is the one excuse for reports and most records as discussed by Dr. Mountin and Miss Flook.†

Although there are many devices and methods of evaluation, there seem to be three principal types. The first is the study of some type of activity report, which should be a current and constant

process; the second is by the use of some type of check list, such as the *Evaluation Schedule* of the American Public Health Association, which should be used at fairly regular intervals; and the third is the formal survey which should only be used to meet special and well defined objectives. Each is dependent on the preceding method, as well as other sources, for basic data. Each is a valuable tool of the local health officer, director of local health service, and the state health officer when judiciously used.

It is commonplace to talk about using activity reports, yet I presume we all have been guilty of sending in the old Quarterly Activity Report without looking at it. The lack of critical attention has occurred at each of the way stations noted, namely, the local unit, the state local health service, and the state department, *per se*. Not too long ago I recall a well trained state records official spending several days correcting quarterly reports which were then transmitted up the line and carefully filed. I believe every local health officer at least deserves a letter about his report from his director of local health service. It requires only a few minutes to see if the local unit has been able to protect any babies that month, or if the expectant mothers are making more than one visit to the prenatal clinics, or whether the sanitarian got around to his water samples, or visited any rural schools. Likewise, it is of great significance for the local staff to pause long enough to see what their collective efforts have been able to accomplish—

\* Presented before the Health Officers Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 13, 1946.

† See page 1137, this issue.

was it 10 or 100 infants protected, or were 2 or 30 per cent of the restaurants visited?

Let us go back for a moment a step farther to the daily work sheets from which the activity report is usually tabulated. It pays a local health officer occasionally to find out who is doing what on his staff. His supervisors should be doing this, of course, in larger units, but sometimes it is a long while between definitive analyses. Since public health staff persons are subject to human frailties, an occasional carefully administered jogging or pat on the back is helpful and probably necessary. More fundamental, of course, is the analysis of these records side by side with the local problems. Significant advances are being made in facilitating this kind of evaluation by the use of punch cards in local health departments.

The use of a check-list or more elaborate inquiry form is also necessary periodically. The development of such an instrument is not simple. After nearly 20 years of growth the current *Evaluation Schedule* is recommended for use by the Committee on Administrative Practice. I admit to a prejudice in its favor but I believe the prejudice is based on having seen it effectively used on many occasions and by as many different methods. The *Schedule* has real limitations. It is not easy to prepare. The *Schedule*, *per se*, is not the important focal point, however, as we all know. It is the *evaluation process* that is useful to the health officer. The *Schedule* is designed to help evaluate the community-wide program. It would be possible, and at times possibly desirable, to develop such a device to apply only to the health department. This would facilitate the preparation of a single form which could be prepared by the local health officer, with copies to his state office, the U. S. Public Health Service, Children's Bureau, A.P.H.A., or anyone else. It seems necessary, how-

ever, to look at the entire community if good program planning and maximum effective action is to be possible.

We cannot discuss all the details of the use of the *Schedule* here, but a few principles can be outlined. The most important, I am sure, is participation by every member of the staff of the health unit, by each agency involved. Personally, I like to take the *Schedule* apart and give appropriate sections to the staff and to other agencies such as schools, tuberculosis associations, etc. For example, it has happened that this is the first time that an engineer or sanitarian has been asked not how many inspections but what is the status of the food control program. This is the fundamental extension from the activity report to the *Evaluation Schedule*—or the program audit which Dr. Mountin described. The participation of public health people in this type of searching for facts is the backbone of good public health work. Parenthetically I might say that the health officer's special part of the *Evaluation Schedule* is the section on the problem analysis and it does not help anybody appreciably for the *clerk* to complete it. The *Schedule* is, however, designed to measure the community program and the community must help prepare it and study it after grading if really effective use is to be made of it.

A second important principle in the *Schedule* is the dominant item idea. It is invaluable in orienting the health officer, the staff, the agency, and the community in the essential relative values in public health. You will recall that it is believed by the Committee on Administrative Practice that there are certain aspects of any health program so essential that if they are not being carried out adequately, the total program must be considered poor. For example, in milk control, one might have a very fine group of dairies with the usual controls but, unless most of

the milk is pasteurized, we could hardly consider the milk control program good. Or, in tuberculosis control we could scarcely feel that we had an effective program if most of the active cases were still at home.

A third basic principle is that the standards by which the *Schedule* is graded are based on actual *practice*. Roughly speaking the standards for poor is the lower quartile of *Health Practice Indices*. In other words, if an activity is not being performed better than the lowest 25 per cent of practice it is considered to be poor. Or if it ranks among the top 25 per cent it is considered good. Obviously the validity of these standards will increase as *Health Practice Indices* includes wider representation from all over the country. Practice as determined by preparing the *Schedule* can be compared to that in *Health Practice Indices* or a standard of practice within the state can easily be established if schedules are available from a significant number of areas.

The division of local health service, in order to provide leadership, to be of maximum assistance and to be assured that maximum public health protection is being afforded with the resources available, needs to have current reliable evaluation data on each local health unit. The *Schedule* seems to be the best device at present to secure this and, therefore, it seems reasonable to think that a copy of a completed *Schedule* should be in use in the Division of Local Health Service for each well established health unit in the state. It will be found to have a great variety of office uses and to make field work much more effective.

There are, of course, a great many instances in which more detailed evaluation is necessary than is suggested by either of the methods discussed so far. Either the activity reports or the *Schedule* will frequently suggest to the

inquiring health officer items on which more information is necessary. For example, if it is learned that 15 per cent of the expectant mothers are receiving public health nursing service it will be important to learn if they are the ones needing the service most. In addition to this type, however, there are 2 areas which are quite important but less often investigated. One is the cost. Cost studies in public health are not new.<sup>1, 2</sup> Some groups of students of government are, however, critical of public health staffs for lack of cost data. These are not easy to determine but are certainly pertinent. Those items for which unit costs can be fairly accurately ascertained, such as laboratory tests or certain routine type visits, should be investigated. Unit costs of some bedside nursing visits can be determined. Costs have been studied at the rapid treatment centers showing a very wide range, and probably these often did not include all costs. We can learn from the techniques of hospital administrators. While cost studies are difficult, we cannot afford to neglect them and must continue to explore the problem.

Another important technique not adequately explored in public health is that of flow studies with regard to the use of referral agencies by the health department, and *vice versa*. A health department which rarely refers a case to another agency or to only one other, can hardly be said to be an effective social agency. The matter of the referral or use of consultation service within the health department itself can also well be studied. Health problems demanding a wide variety of skills and teamwork for their solution are the rule rather than the exception.

The final broad type of evaluation is the formal survey, usually done by a survey group outside the jurisdiction itself, in contrast to those discussed so far which are very definitely to be done by the local health unit. This fact that



the local unit does not prepare a survey constitutes a major weakness. Self evaluation is surely the most effective method. Occasions arise, however, which make the survey method useful, as for instance when a major reorganization seems indicated, or extensive inter-agency relationships are involved, or when there is serious disagreement as to overall public health problems. Such surveys are, of course, most commonly made by outstanding public health authorities, or a professional organization. The reports invariably require wide community support and understanding for their implementation. There is another type developing, however, which is of possibly greater significance to us here. Some state health departments with numerous well developed local units have found a need to use the survey technique. It is done by a team specially recruited from the state department staff, or by a field unit of local health service. It is, of course, merely an extension of the use of the field unit as described by Dr. Harry E. Handley in 1938.<sup>3</sup> The survey team will usually use the *Evaluation Schedule* as a nucleus and extend its researches into time studies of the staff, costs, flow studies, and appraisal of inter-agency relationships, etc. The technique can

probably be of real value in the *development* of full-time local health service in areas now served by entrenched part-time service. It might be an equitable method of settling major disputes of personnel and subsidy. It should constitute an important resource in evaluating policies of state and local departments.

Evaluation of local health work then is an essential part and should be specifically incorporated in all health program planning. Its effective use is good preventive medicine against complacency and self-satisfaction. It should be carried on continuously by the use of activity reports and critical indices; at regular intervals by some such device as the *Evaluation Schedule*; and occasionally for definite, major objectives by the survey method. It is a responsibility of the local health officer, the director of local health services and the state health officer.

#### REFERENCES

1. Walker, W. Frank, Williams, W. Carter, and Underwood, Felix J. The Costs of Rural Public Health Services. *A.J.P.H.*, 32, 7:681 (July), 1942.
2. Ridley, Clarence E., and Nolting, Orin F. *How Cities Can Cut Costs*. The Inter-National City Managers' Association. 1933.
3. Handley, Harry E., M.D. *The Field Unit in Local Public Health Service*. New York: The Commonwealth Fund. 1938.

# Penicillin in the Treatment of Infectious Bovine Mastitis\*

C. S. BRYAN, PH.D., D.V.M., F.A.P.H.A.

*Department of Surgery and Medicine, Michigan State College, East Lansing, Mich.*

MANY laymen and veterinarians misunderstand the use of the udder infusions in the treatment and control of bovine mastitis since they assume incorrectly that all cows with udder trouble should be treated with these materials. Udder infusions are effective only against infection and are of *no value* where the cause is non-infectious in nature. In fact, the use of udder infusion in such cases may aggravate the trouble.

Cows that produce market milk must be healthy (especially free from udder infection), clean, and stabled in sanitary quarters if the milk produced is to be safe and of reasonable high quality. The presence of infectious mastitis in the lactating cows, and the lack of application of proper and adequate sanitary procedures in handling the milk, result in bacterial contamination of the milk. Everyone concerned (veterinarian, dairy farmer, milk sanitarian, and milk plant operator) must know something about the cause and the types of mastitis if the essential proper herd management procedures are to be applied in solving the mastitis problem of the individual herd.

## WHAT IS MASTITIS?

Mastitis is a very general term that refers to any inflammation of the udder; such as the physiological

swelling or congestion at "freshening" or that resulting from udder or teat injuries, or it can be the pathological change in the udder tissue as the result of infection. In so far as the condition of the cow and/or her udder is concerned, the mastitis may be classified as acute or chronic.

## ACUTE AND CHRONIC MASTITIS

Acute mastitis may be divided into acute local mastitis and acute systemic mastitis. In the acute local mastitis, the symptoms of swelling, pain, and the production of milk of abnormal physical appearance are confined to the udder. The cow is eating well, and has a good appearance except for the udder changes. The acute systemic mastitis is characterized by a visibly sick cow in addition to the symptoms in the udder. The acute local mastitis may progress in severity to develop into the destructive and oftentimes highly fatal acute systemic mastitis.

Chronic mastitis is usually characterized by the absence of any painful swelling of the udder and by the production of a decreased amount of milk of normal physical appearance. Therefore, a cow may be infected for periods varying from a few weeks to several years before having an acute attack, and before the owner may become aware of the presence of the disease. The chronic mastitis may "flare-up" and become either acute local or acute systemic in nature. If death of the cow does not occur and treatment is in-

\* Presented before the Laboratory Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, on November 14, 1946.

stituted, the acute condition may abate and chronic mastitis persist. This change from chronic to acute mastitis and *vice versa* may occur irrespective of the cause of the disease.

#### NON-INFECTIOUS AND INFECTIOUS MASTITIS

Udder troubles may be classified as non-infectious and infectious mastitis from the standpoint of cause. Such non-infectious factors as chilling, bruising, and injury of the udder or teats, rough handling of the udder during hand or machine milking, and the adverse effects, in some cows, of irregular or incomplete milking may cause mastitis of an acute or chronic nature depending upon the severity of the non-infectious agent or condition. Further, the damaging effects of non-infectious mastitis may predispose the udder to infection by bacteria.

The streptococcus group of bacteria most commonly causes the udder infection of a chronic type, but at times the streptococci and usually infection by *Staphylococcus aureus*, *Corynebacterium pyogenes*, and/or *Escherichia coli* and other bacteria produce an acute mastitis.

#### THE PREVENTION, CONTROL AND TREATMENT OF MASTITIS

The available scientific data, substantiated by field trials, indicate that the successful program for the prevention and control of bovine mastitis must include the following items in the order presented. Any effort to change this order is doomed to failure.

##### A. Good, sanitary milking procedures:

1. Arrange and/or milk cows in following order: healthy, suspicious, and infected.
2. Discard the foremilk into a strip cup, exclude from supply all abnormal milk.
3. Wipe the udder of each cow with warm (120° F.) disinfectant one minute before milking.
4. Exclude infected humans from milking cows.

5. Dip teat cups of milker in disinfectant between cows (have milk tube valve in head of machine open).

6. The hands of person milking or stripping should be dipped in disinfectant between cows.

7. Milk each cow regularly, rapidly, and completely for udder health; employ a system of managed milking.

##### B. Good, sanitary herd management procedures:

1. Proper stalls for cows.
2. Prompt treatment of udder and teat injuries.
3. Clean and disinfect stalls upon removal of infected cows.
4. Keep barn and barnyard clean and dry.
5. Raise heifers as disease-free replacements.
6. Early removal of accessory teats.
7. Preferred source of herd replacements; a—home raised heifers, b—purchase of bred heifers, c—purchase of milking cows—test before purchase.

##### C. Early and accurate diagnosis:

1. Physical examination of each cow's udder.
2. Bacteriological test to determine if infection is present or absent.

The physical examination of the udder and milk is valuable in determining the clinical condition of the cow and her udder. This information is important when a final decision must be made concerning the disposition and treatment of the individual case of mastitis. However, bacteriological procedures must be applied to properly collected milk samples to make the specific diagnosis of infection—if the infectious bacteria are present—or to exclude infection and, therefore, suggest that the cause of the trouble is non-infectious in nature. In my opinion, the veterinarian and dairyman must know the cause of the mastitis before they can intelligently apply preventive procedures or specific curative udder infusion treatments.

##### D. Elimination by slaughter or complete segregation of infected cows with badly damaged udders.

1. Such cows usually do not respond to udder infusion treatments.
  2. This eliminates or confines the source of infection.
- E. Early and proper treatment.
1. A high percentage of cows, without marked change in the udder, recover by udder infusions.
  2. Udder infusions are of value only where infection is the cause of the mastitis.
  3. Control measures must accompany treatment or the recovered case may become reinfected.

The judicious use of the udder infusions in treating infectious mastitis must necessarily be accompanied by sanitary milking procedures and farm sanitation if the occurrence of infection is to be prevented; otherwise, the recovered case becomes reëxposed and reinfection may occur.

#### PENICILLIN LEVELS OF MILK FOLLOWING UDDER INFUSIONS

The concentration of penicillin required in the infected area depends on the susceptibility of the infecting organism. The strains of hemolytic staphylococcus of bovine (mastitis) origin, and the group B streptococcus (*Streptococcus agalactiae*) are practically all inhibited by 0.025 units of penicillin per ml. Thus a concentration of 1 unit per ml. of milk should give a safe margin for these organisms.

In 1945 Murnane<sup>4</sup> reported relative to the units of penicillin in milk at different time periods following the infusion of 15,000 units per quarter into

cows in varying stages of lactation. These data, presented in Table 1, indicate the effective level maintained for a relatively long period of time.

#### EFFICACY OF PENICILLIN IN THE TREATMENT OF INFECTIOUS MASTITIS

When streptococcus and staphylococcus infected animals, without marked physical changes in the udder, are treated with either an aqueous or oil solution, the various investigators have reported recoveries (become free from udder infection) in approximately 50 to 90 per cent of the cases. More recently, mastics—a new penicillin medication form—have been used by us to treat a series of 82 cows with chronic streptococcic mastitis which upon physical examination were deemed suitable subjects for treatment. Seventy-six or 92.6 per cent of the treated cows became free from the udder infection while 6 or 7.4 per cent remained infected despite repeated treatment. These data indicate the value of penicillin in the treatment of infectious mastitis caused by organisms that are susceptible to penicillin; in addition, they show that not all cows considered as good subjects for treatment will respond to the penicillin therapy.

#### PENICILLIN IN HERD TREATMENT OF INFECTIOUS MASTITIS

The necessity for good management procedures in the herd undergoing

TABLE 1  
*Penicillin Levels in the Milk at 4 Hour Intervals After Administration to Cows in Various Stages of Lactation*

State of Lactation	Penicillin Concentration			
	Administered 100 ml. of Solution	After 4 Hrs.	After 8 Hrs.	After 12 Hrs.
Early (in full milk)	150 u. in 1 ml.	40 u. in 1 ml.	4 u. in 1 ml.	0.6 u. in 1 ml.
Middle (moderate milk flow)	"	42 "	16 "	4 "
Late (drying off)	"	81 "	33 "	21 "
Dry	"	81 "	66 "	40 "

TABLE 2

The Results of Penicillin Treatment in Herds Under Good, and Herds Under Poor Management

Herd	Total Cows	Injected Cows			Treated with 25,000 Units of Penicillin /Quarter in 50 ml. of Sterile Water	Results in Months After Treatment						
		Total	Slaugh-tered	Treated		½	1	2	3	4	5	6
Herd Under Good Management Procedures												
					3 times at 24 hr. intervals							
1	15	2	0	2	" "	2—	2—	2—	2—	2—	2—	2—
2	18	8	1	7	" "	7—	7—	7—	7—	6—, 1+	7—	7—
3	21	5	0	5	" "	5—	5—	5—	5—	5—	5—	5—
Herd Under Poor Management Procedures												
					3 times at 24 hr. intervals							
4	10	8	2	6	" "	5—, 1+	5—, 1+	3—, 3+*	4—, 2+*	5—, 1+	3—, 3+	2—, 4
5	17	12	4	8	" "	7—, 1+	6—, 2+	3—, 5+*	6—, 2+	6—, 2+	2—, 6+	1—, 7
6	20	10	3	7	" "	7—	6—, 1+	6—, 1+	5—, 2+*	6—, 1+*	3—, 4+	3—, 4

\* Again treated as before.

penicillin udder infusion treatment is presented by the data of Table 2. In only one case, herd 2, did a treated and recovered case become reexposed and reinfected, whereas reinfection was the rule in the herds under poor herd management practices. The treated and recovered case must be protected from reexposure by good, sanitary milking and herd management procedures since the successful treatment does not impart any immunity to the animal. If this is done the udder infusion treatments, such as penicillin, can be a real aid to mastitis control.

#### SUMMARY

The successful prevention, control, and treatment of mastitis includes, in the following order:

1. Good sanitary milking procedures.
2. Good herd management procedures.
3. Early and proper diagnosis.
4. The elimination from the herd of infected cows with badly damaged udders.
5. Early and proper treatment, penicillin is effective in a large number, but not all, of

the cases of infectious mastitis caused by organism susceptible to penicillin.

#### REFERENCES

1. Barker, C. A. V. Observations on the Use of Penicillin in the Treatment of Bovine Mastitis. *Canad. J. Comp. Med. & Vet. Med.*, 9(9):235-243, 1945.
2. Bryan, C. S., Horwood, R. E., and Huffman, C. F. A Preliminary Report on Penicillin in the Treatment of Chronic Streptococcal Mastitis. *Vet. Med.*, 40(3):87-89, 1945.
3. Kakavas, J. C. Penicillin in the Treatment of Bovine Mastitis. *North Am. Vet.*, 25(7):408-412, 1944.
4. Murnane, D. A Preliminary Report on the Treatment of Clinical and Sub-clinical Streptococcus and Staphylococcus Infections of the Bovine Udder with Penicillin. *Australian Vet. J.*, 21(4):82-90, 1945.
5. Murphy, J. M., and Pfau, K. O. The Value of Local Injections of Penicillin Sodium in the Treatment of *Streptococcus agalactiae* Infection and Mastitis in Cows. *Cornell Vet.*, 35(2):87-102, 1945.
6. Slanetz, L. W., and Allen, F. E. Treatment of Bovine Mastitis with Penicillin. *J. Am. Vet. M. A.*, 107(820):18-20, 1945.
7. Schalm, O. W. Recommendations for the Use of Penicillin in the Treatment of Bovine Mastitis. *Univ. of California Mimeograph.*, 3 pp., 1945.
8. Schofield, Frank W. Penicillin in the Treatment of Mastitis. *Canad. J. Comp. Med. & Vet. Med.*, 10(3):63-70, 1946.
9. Walker, John W. Penicillin in Peanut Oil with 3 per cent Beeswax; Local Use in Staphylococcal Mastitis. *J. Am. Vet. M. A.*, 105(831):413-421, 1946.

# Oral Environment and Fluorine\*

GERALD J. COX, Ph.D.

*Corn Products Refining Company, Chemical Division, Argo, Ill.*

## FLUORINE AND DENTAL CARIES:

### SOME SALIENT POINTS

THE history of fluorine† and dental caries begins with the discovery of fluorine in a fossilized elephant tooth by Morichini, as reported by Morozzo<sup>43</sup> in 1803. Nearly one hundred years later Eager<sup>23</sup> observed black teeth among natives of Pozzuoli, Italy. This condition was described by Black and McKay<sup>11</sup> in children of Colorado Springs and called "mottled enamel." Fluorine in the drinking water at the time of formation of the enamel was shown to be the cause of mottled enamel in 1931 by Churchill (reported by Theriault<sup>49</sup>) and by Smith, Lantz, and Smith.<sup>47</sup>

Armstrong and Brekhuis<sup>4</sup> found the fluorine content of the enamel of 46 sound human teeth to average 111 p.p.m.; that of 39 carious teeth averaged 69 p.p.m. The difference of the means was 11.9 times its standard error. They also found<sup>3</sup> that the fluorine content of mottled enamel ranged from 250 to 361 p.p.m., and that severe caries existed in some of these mottled enamel teeth. Caries, or at least a condition thus far not distinguished from caries, is frequently observed in teeth with mottled enamel.<sup>36</sup>

Miller<sup>37</sup> markedly inhibited dental caries in the albino rat by feeding 250 p.p.m. of sodium fluoride in a caries

producing diet. Cox, Matuschak, Dixon, Dodds, and Walker<sup>19</sup> reduced the incidence of caries in young rats by feeding their mothers rations containing from 10.3 to 41.2 p.p.m. of fluorine during pregnancy and lactation. The experiment of Miller<sup>37</sup> was one in *posteruptive* prevention of caries by a high level of fluoride feeding; that of Cox, et al.<sup>19</sup> prevention by the traces of fluoride transmitted to the young by the mother only during the *period of formation* of the enamel and *prior to eruption* of the teeth.

Dean, Jay, Arnold, McClure, and Elvove<sup>22</sup> observed a rate of 194 carious permanent teeth per 100 individuals in 243 children, 12 to 14 years of age, and of continuous residence in Galesburg, Ill., where the water supply had 1.8 p.p.m. of fluorine. They found a rate of 628 carious teeth in a comparable group of 291 children in Quincy, Ill., with 0.2 p.p.m. of fluorine in the water supply. It is of particular interest that they found a much greater reduction of the incidence of caries in the upper anterior teeth than in the molars. Dean and his coworkers extended their surveys with similar findings<sup>21</sup> in other cities with a total of 7,257 children studied. Their observations have been confirmed by others in widely scattered parts of the world.

Volker<sup>50</sup> found that powdered human enamel showed a significantly diminished solubility at pH 4.0 after it was shaken for one hour with sodium fluoride solutions as dilute as 100 p.p.m. His data give positive evidence that reduction of caries by fluorine is due to reduced solution of enamel by acids

\* Presented before a Joint Session of the Food and Nutrition and Dental Health Sections of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 14, 1946.

† "Fluorine" in dental caries literature never means elementary fluorine but the "fluoride ion" in solutions, or "combined fluorine" in solids such as salts or dental enamel.

produced by bacteria. Cox<sup>18</sup> and McClure<sup>34</sup> found (a) that the fluorine content of human saliva is of the order of only 0.1 p.p.m., and (b) that it is not significantly different in the salivas of children from areas with low fluoride waters and those with fluorine in the water up to 1.8 p.p.m.

Cheyne<sup>14</sup> made topical applications of 500 p.p.m. fluoride solutions at 3 month intervals to the deciduous teeth of children and reported an average of 3.09 new carious surfaces in a year as compared with 6.04 in a control group. Bibby<sup>7</sup> applied 1,000 p.p.m. sodium fluoride every 4 months to the permanent teeth of children. In a year, 60 new cavities appeared in control teeth and 33 in treated teeth.

#### ORAL ENVIRONMENT AND DENTAL CARIES

Predecessors of W. D. Miller suggested that microorganisms were factors in dental caries but he was the first to give an effective presentation of facts to support what is now known as the "oral environment" theory of dental caries. Miller, an American dentist studying in Berlin, in 1882<sup>38</sup> announced the two essential parts of his chemico-parasitic theory, namely, that the decalcification of the teeth in caries is due to acids formed *in situ* by microorganisms and that the acids are formed from carbohydrates. In a series of papers, which were later summarized in a book,<sup>40</sup> he described the bacilli associated with caries and produced caries-like areas in extracted teeth immersed for long periods in fermenting mixtures of bread and saliva. It is important to note that Miller considered that he had not found all the factors in tooth decay as he wrote<sup>39</sup>: "The extent to which any tooth suffers from the action of the acid depends upon its density and structure, but more particularly upon the perfection of the enamel and the protection of the neck of the tooth by healthy gums. What we might call the

perfect tooth would resist indefinitely the same acid to which a tooth of opposite character would succumb in a few weeks." This *opinion* is generally ignored by the extreme oral environmentalist who asserts that any tooth will succumb to caries; it is the best hope of the nutritionist, whether he believes in pre- or post-eruptive influences on enamel or both.

Since the time of Miller, bacteriologists have sought to identify organisms associated with caries. Some of the early workers who described *L. acidophilus* types were Goadby,<sup>25</sup> Moro,<sup>42</sup> Howe and Hatch,<sup>29</sup> Rodriguez,<sup>45</sup> and McIntosh, James, and Lazarus-Barlow.<sup>35</sup> Those who isolated streptococci from carious lesions and assigned to them a causal rôle were Sieberth,<sup>46</sup> Baumgartner,<sup>6</sup> Niedergesäss,<sup>44</sup> Hartzell and Henrici,<sup>26</sup> Sperling,<sup>48</sup> and Clarke.<sup>15</sup>

There has been considerable controversy over the relative contribution of lactobacilli and streptococci to the carious process. Bunting and Jay and their associates in a number of papers have shown the high correlation of counts of lactobacilli and *caries activity*. Jay<sup>30</sup> has said, "Many do not agree that causal relationship exists between the lactobacilli and dental caries. Regardless of this controversial point, these organisms afford an excellent means of estimating caries activity . . ." It is argued that streptococci are more active agents in caries since they are more frequently found in the advancing border of the carious process<sup>26</sup> and are more rapid acid formers.<sup>9</sup>

There have been attempts to immunize human subjects against dental caries by means of vaccines made from oral strains of *Lactobacillus acidophilus*. For example, Williams<sup>52</sup> has shown that following the use of such vaccines, blood agglutinin titers were increased but only 5 of 20 subjects showed a significant reduction in salivary counts for lactobacilli. No changes were found in the

dental conditions in respect to existing cavities or in new carious lesions. There are apparently antibacterial substances in human saliva "which destroy, inhibit growth, or so change the organisms that they lose pathogenicity" as shown by Hill<sup>27</sup> and by others. These substances may or may not be related to caries immunity.

Kendall<sup>31</sup> in 1910 introduced the term "aciduric" meaning "to endure acid" as being more appropriate than "acidophilic" when applied to organisms that can survive in media of high acid content. Gies and Kligler<sup>24</sup> considered the aciduric property to be one of the essentials of a caries producing organism, and Rodriguez<sup>45</sup> and McIntosh, James and Lazarus-Barlow<sup>35</sup> made survival at low pH the criterion by which to judge the relative caries producing power of an organism. By means of this hypothesis, streptococci, which relatively are weakly aciduric, were excluded from a causal rôle in spite of their continued existence in deep lesions where presumably low pH conditions should exterminate them. The aciduric hypothesis led to the adoption of media of low pH for study of bacteria associated with caries. Obviously this arbitrary procedure resulted in the suppression of streptococci and obscuration of their possible role in caries.

Bibby, Volker, and Van Kesteren<sup>9</sup> found that the amount of tooth substance dissolved by oral bacteria was proportional to the amount of acid formed. This relation of *acidogenic* rather than *aciduric* power to the production of dental cavities is the more logical. Bibby, et al. also showed that (a) streptococcal forms are more numerous in carious lesions, (b) streptococci form acid much more rapidly than lactobacilli, and (c) lactobacilli probably form no more than 0.025 per cent of the total acid arising from carbohydrates due to organisms found *in saliva*. They pointed out that neutralization of acid

by dental tissues keeps the pH high enough for streptococci to survive.

Williams<sup>51</sup> observed dense masses of bacteria on teeth and considered such plaques as essential in the initiation of caries. Black<sup>10</sup> said, "The one thing necessary to the beginning of caries is the formation of such a gelatinous plaque in a secluded position where its acids may act . . ." Miller<sup>41</sup> did not accept plaques as essential to his theory and pointed out that plaques frequently occurred where caries is seldom found and that he had found incipient caries with no plaque cover. Blayney, Kesel, and Wach<sup>12</sup> observed caries with some plaques but not with others and associated the presence of lactobacilli in the plaques with the occurrence of caries.

#### INTERIM SUMMARY

The following points are summarized from the foregoing considerations of both fluorine and oral environment in dental caries:

Excessive fluorine during the period of formation of the enamel causes mottled enamel.

The condition of unmottled enamel, with respect to caries is related to fluorine in that sound enamel has a fluorine content of about 111 p.p.m. and enamel from decayed teeth about 69 p.p.m.

The fluorine content of mottled enamel ranges from 250 to 361 p.p.m.

Teeth with mottled enamel decay.

Sodium fluoride, given to young rats as 250 p.p.m. in the food *after* their teeth are erupted, markedly inhibits caries activity.

Fluorine, as transmitted to rats through the placenta and the mammary glands before eruption of the teeth, causes a significant reduction in the incidence of caries.

The rate of incidence of caries in children is significantly lower in areas with up to 1.8 p.p.m. fluorine in the drinking water than in regions with fluorine of the order of 0.2 p.p.m.

The reduction of caries in man by fluorine in the drinking water is greater in the upper anterior teeth than in the molars.

Exposure of powdered enamel to fluoride solutions reduces the rate of solution of the enamel at pH 4.0.

The fluorine content of human saliva is of the order of 0.1 p.p.m. and is unaffected by the



fluorine content of the community water supply up to 1.8 p.p.m.

Topical application to human teeth of fluoride solutions of the order of 500 p.p.m. and over, results in a significant reduction in new carious surfaces.

The production of cavities in teeth is said to be caused by acids formed by bacteria thriving predominantly on carbohydrates.

The count of *L. acidophilus* in saliva is an index of caries activity.

There is no convincing proof that any organism or group of organisms is specific in the production of carious lesions.

Successful immunization of human subjects against dental caries by means of vaccines has not been achieved.

There are antibacterial substances in saliva.

The cavity producing power of micro-organisms is probably more related to their ability to produce acid than to survival in acid media.

#### IMPACT OF FLUORINE ON THE ORAL ENVIRONMENT THEORY

Fluorine was one of the factors in dental caries unknown to W. D. Miller.<sup>40</sup> However, the discoveries of the last ten years on the influence of fluorine on the course of dental caries in no way weakens the position of Miller, rather, it has made it more difficult to explain caries exclusively as independent of the tooth. Resistance to caries through nutrition is supported at least by the idea that caries-resistant teeth result<sup>19</sup> when an optimum amount of fluorine is available during the formation of dental enamel.

With the advent of fluorine as an anti-caries factor the theories of cause of tooth decay should have been thoroughly reexamined and the action of fluorine studied from the many viewpoints. Unfortunately, because fluorides were known to be enzyme inhibitors and also retarders of bacterial development, the oral environmentalists early captured the field and bent fluorides to the purpose of proving rather than testing their theories. On the other hand, the toxicity of fluorides was against nutrition theorists and toxicity was emphasized by mottled enamel, a dystrophy displayed in the very tissue that a

fluoride prophylactist would venture to protect.

In the case of both oral environment and nutrition theories, the quantitative phase of fluorine has been too little noticed. The fluorine content of waters that reduce the incidence of caries in children is of the order of 1 p.p.m.<sup>21</sup> Wright<sup>53</sup> found that a minimum concentration of 10 p.p.m. of fluorine affected acid formation from sucrose by a streptococcus. Bibby and Van Kesteren<sup>8</sup> concluded that fluorine concentrations of less than 1 p.p.m. "limit acid production by bacteria but concentrations in excess of 250 p.p.m. are needed to affect bacterial growth." It is to be noted that these are fluorine concentrations in continuous contact with the bacteria and not those of intermittent exposure as in the act of drinking of water. Consequently, it is not likely that the fluorine in drinking water up to 2 p.p.m. would retard acid formation by bacteria.

A generally accepted and an essential part of the oral environment theory of caries is that the acid which decalcifies teeth is derived from carbohydrate. Miller's<sup>40</sup> observations were made using bread as a source of carbohydrates. As it is simpler to prepare sugar media for culture of bacteria, it is possible that attention has been focused on the sugars as the "cause" of caries.

The albino rat is unique in that it does not develop dental caries after long consumption of diets containing glucose, sucrose, lactose, maltose, or corn starch at a level of two thirds of the ration.<sup>33</sup> Caries does not result in white rats in a year on a 53 per cent sucrose diet with lactobacilli forced into their mouths thrice weekly.<sup>32</sup> Yet if caries is initiated in the albino rat and fermentable carbohydrates are supplied, the cavities increase in size but not in number.<sup>16, 28</sup> These observations suggest that the process of *initiation* of caries may be different from that of *increasing* cavity

size. Such a hypothesis differentiating initiation from promotion of caries may be useful in clarifying the influence of fluorine in the prevention of caries since the influence of that element seems to be absolute prevention at a given site rather than a factor which slows the rate of cavity development. If this should prove to be true, then by means of fluorine, teeth can be formed that will not decay under the influence of bacteria and carbohydrate. Fluorine may also act to slow the rate of cavity development because it lowers the rate of solution of the enamel.<sup>50</sup>

It is unlikely that fluorine can be the salivary antibacterial substance of Hill<sup>27</sup> since it is only present to the extent of 0.1 p.p.m.<sup>18, 34</sup> It is also unlikely that the fluorine of saliva can diminish acid formation by bacteria as it is below the levels found by Wright<sup>53</sup> and Bibby and Van Kesteren<sup>8</sup> to affect acid formation. Also, a difference in fluorine content of the salivas would necessarily have to exist to invoke an acid-inhibiting theory that the reduction of caries incidence is related to the fluorine in saliva.

Dean, et al.<sup>22</sup> noted that the count of *L. acidophilus* in the salivas of Galesburg children—1.8 p.p.m. fluorine in the water—was lower than in the salivas of Quincy children with 0.2 p.p.m. fluorine. This diminished count according to Bibby and Van Kesteren<sup>8</sup> would require a concentration of 250 p.p.m. and could not therefore be due to the fluorine of either the intermittently imbibed water or the continuously present fluorine of the saliva. The only concentration of fluorine in the mouth high enough to retard bacterial growth is in the enamel and it would seem illogical to invoke fluorine in such an immobile state to be effective. It would seem that fluorine could only retard the activities of bacteria by entering into their cells.

It is of interest in the relation of

fluorine to plaques and caries that Day<sup>20</sup> found plaques on the teeth of 309 of 314 children of whom 74 per cent had mottled enamel and an incidence of only 0.62 carious cavities. This indicates that certain plaque organisms can exist in contact with a high content of fluorine. The organisms in these plaques, however, may not have been those which are associated with dental caries.

It is to be noted that the concentrations of fluorine used in topical applications<sup>14, 7</sup> have been of the order of, or in excess of the 250 p.p.m. stated to retard bacterial development.<sup>8</sup> It is therefore possible that the fluoride solutions have had a sterilizing influence on the flora of the teeth. If bacteria in undetected beginning caries were destroyed, a reduction later in new cavities would possibly result. If a control series in these experiments with a nonfluoride bactericidal agent had been used, the specific action of fluorine would have been tested. The value of topically applied fluorine in explaining the true action of lowered incidence of caries in areas with fluorine containing waters is therefore questionable.

Dean, et al.<sup>22</sup> noted that caries in the upper anterior teeth was prevented much more by fluoride waters than caries in the molars. Volker<sup>50</sup> was the first to suggest that this phenomenon was because of greater contact of the anterior teeth with water in the act of drinking. Anderson has described mottled enamel among Chinese<sup>1</sup> and dental caries.<sup>2</sup> (Dr. Anderson, in a personal communication, has stated that the two reports dealt with the same group of Chinese.) In the *permanent* teeth the pattern of decay was that observed by Dean, et al., with only 4 of 3,211 upper incisors affected. But in the *deciduous* dentition the rate of decay of anterior teeth was at a much higher rate than in the permanent teeth and was not different from that of the molars. This would imply that the con-

tact with drinking water is not the true explanation of the low rate of caries in anterior compared with posterior teeth.

Unfortunately the reports of Dean and his coworkers and of Anderson do not show the incidence of decay in specific areas of the teeth. It may be suspected that decay is restricted to pits and fissures of the molars and that the lateral surfaces would be as free of caries as are the upper incisors. If this were found to be true in future studies, the better explanation of this aspect of fluorine prevention of caries would be from preëruptive influences. The oral environmentalist explains the occurrence of caries in well recognized vulnerable areas such as in the pits and fissures of molars and in inter-proximal sites as due to retention of food. This explanation is satisfactory for the promotion of caries once initiated but fails in the face of the erratic incidence of decay in adjacent teeth. Bödecker and Ewen<sup>13</sup> reported: "An examination of 516 full mouth x-rays, selected at random showed 179 carious lesions affecting only one of two closely contacting teeth. This condition (unilateral caries) indicates that food retention, bacteria, and saliva cannot be the *sole* factors in dental destruction." They indicated belief in variable resistance of the teeth. Such variable resistance could well be due to variations in available fluorine during formation of the teeth. If it were shown that adjacent teeth have different levels of fluorine plus the related resistance to caries this situation could only be explained by preëruptive influences including variations in the fluorine supply.

Cox<sup>17</sup> discussed fluoridization of community water supplies with seasonal variation according to water consumption so as to provide for a constant year round intake of fluorine. The reason for such constancy was to maintain as high a level of fluorine intake as possible without causing mottled enamel, with the expectation of forming enamel with

the greatest resistance to caries. Other proposals to add fluorides to water, such as those of Ast,<sup>5</sup> provide for a year round level of 1 p.p.m. of fluoride. This method provides for a constant level of fluorine for oral environment but a variable amount from the viewpoint of nutrition. This method of providing 1 p.p.m. of fluorine is being applied now in several communities.

One of the precepts of current studies<sup>5</sup> on the addition of fluorides to community water supplies is that a period of years must elapse before results can be known. Certainly this is not true if the action of the fluorine is on the oral environment, and reports dealing with that phase should soon be forthcoming. But if the action is through formation of caries-resistant enamel, that is, through a nutritive mechanism, the results cannot be known for years.

It is not necessary to wait for the outcome of experiments on human populations to determine the detrimental effects, if any, of adding fluorine to water supplies. The field pioneered by Dean, et al.<sup>22</sup> remains almost unexplored as to other than dental effects of fluorine and proper investigation can be made at once on populations with long exposure to fluoride waters.

Dean and his associates confined their attention to children of continuous residence in the communities they examined. If they had included migrants at various ages, they could have cast much light on the permanence of fluorine in preventing caries or, in other words, could have determined whether it is a matter of oral environment or of nutrition. Such studies should include the examination of children moving into and out of communities where experimental additions of fluorine to water supplies are being made.

The mechanism by which fluorine protects teeth remains unknown. It appears, at least in the anterior teeth, to prevent caries in the sense that no decay appears.

This would seem to indicate that it prevents initiation of decay. Once caries is initiated it may progress less rapidly in teeth with increased fluorine, but the fact that mottled enamel teeth become carious<sup>34, 36</sup> indicates that the fluorine content of the teeth acts neither to inhibit bacterial life nor solution of the enamel by the acids formed by micro-organisms.

It would seem wise to return to the view of Miller<sup>39</sup> that structure of the enamel is a factor determining whether or not a tooth surface will become carious. The structure, so far as it is influenced by fluorine, should be viewed as acting to resist caries either because of a part played by fluorine in its make-up or by an effect of fluorine on the cells that deposit the enamel. In the latter case, the increased fluorine content of the enamel would be only adventitious.

It is fortunate for oral environmentalists that they are divided in general in their philosophy only as to the identity of the microorganisms that "cause" dental caries. If an organism specific for dental caries exists, immunization against the disease might be possible if such immunity could be induced upon the oral cavity. Such immunization has not been achieved and hence the matter of a specific organism remains only of academic importance.

It is unfortunate for the millions of sufferers from dental caries that the oral environmentalists prefer their unanimity of opinion that any tooth will decay if only carbohydrates and acid-forming bacteria are in contact with it, and reject the viewpoint that resistance to caries can be built into the enamel by nutrition. Their assurance, based largely upon observations in the Petri dish, blocks proper collection and analysis of data on dental caries, such as the frequency of attack in specific areas. Since bacteriologists can most readily collect saliva and plaque specimens from human mouths, they have not made large use

of experimental animals. Therefore, they tend to reject the evidence from the albino rat that initiation of caries may differ in its mechanism from further development of a cavity.

It is unfortunate that nutritionists are divided in their philosophy in the field of dental caries. A major schism exists in the matter of pre- and post-eruptive effects of nutrition on dental caries. This is of primary importance as affecting the way in which fluorine as well as calcium, phosphorus, and vitamins A, C, and D are applied in relation to dental caries. Nutritionists seem content to accept and analyze the data of dental caries on a whole mouth basis in the manner of the oral environmentalist rather than by the area by area method that challenges the theories of both these opposing groups. Nutritionists have not yet declared fluorine an essential factor in caries. This withholding of opinion is undoubtedly because of the prior knowledge of its toxicity, uncertainty of the mechanism in its prevention of caries, and, also because teeth themselves may not be regarded as essential. But it is fortunate for the millions of sufferers from dental caries that division of opinion exists among nutritionists since from such conflicts and doubts come the stimuli for research that will eventually lead to methods to prevent, as well as control, dental caries.

Large-scale experiments are now being conducted in several localities on the effects on dental caries of the addition of fluorine to the community water supplies. These additions are being made on the oral environment basis of a uniform level throughout the year, and the level is held low because of fear of producing mottled enamel and other possible injuries. Dosage cannot yet be made on a nutritional basis, except by guess, because the necessary knowledge is lacking on (a) the optimum requirement for fluorine and (b) the variability of the intake of drinking water by

children in relation to season. The constant level procedure of the fluoridization of water supplies, however, will provide a test of the general effectiveness of fluorine in the prevention of dental caries. It is to be hoped that those in charge of the studies (a) will report the data on frequency of caries in specific areas of the teeth and not on a whole tooth basis, (b) that the original data will be made available, and not suppressed by resort to expression by rates, and (c) that especial attention will be given to individuals who have varying degrees of exposure to fluoride-bearing waters. Such data will aid in the decision as to the degree in which fluorine acts as an element in nutrition and in oral environment.

If it should be shown eventually that fluorine acts through channels generally viewed as nutritional, this finding should not be permitted to cause acceptance of all other factors that may be related to dental caries through nutrition, nor should it be allowed to diminish the importance of the oral environmental factors in development of cavities in teeth that are not conditioned to resist dental caries.

#### REFERENCES

1. Anderson, B. G. An Endemic Center of Mottled Enamel in China. *J. Dent. Research*, 12:591, 1932.
2. Anderson, B. G. A Study of the Incidence of Dental Caries in One Thousand Chinese. *J. Dent. Research*, 12:709, 1932.
3. Armstrong, W. D., and Brekhuis, P. J. Chemical Composition of Enamel and Dentin. II. Fluorine Content. *J. Dent. Research*, 17:27, 1938.
4. Armstrong, W. D., and Brekhuis, P. J. Possible Relationship Between the Fluorine Content of Enamel and Resistance to Dental Caries. *J. Dent. Research*, 17:393, 1938.
5. Ast, D. B. The Caries-Fluorine Hypothesis and a Suggested Study to Test Its Application. *Pub. Health Rep.*, 58:857, 1943.
6. Baumgartner, E. Die Zahnkaries—eine Streptomykose. *Wien. klin. Wchnschr.*, 26:178, 1913.
7. Bibby, B. G. Preliminary Report on the Use of Sodium Fluoride Applications in Caries Prophylaxis. *J. Dent. Research*, 21:314, 1942.
8. Bibby, B. G., and Van Kesteren, M. The Effect of Fluorine on Mouth Bacteria. *J. Dent. Research*, 19:391, 1940.
9. Bibby, B. G., Volker, J. F., and Van Kesteren, M. Acid Production and Tooth Decalcification by Oral Bacteria. *J. Dent. Research*, 21:61, 1942.
10. Black, G. V. Dr. Black's Conclusions Reviewed Again. *Dental Cosmos*, 40:440, 1898.
11. Black, G. V., with McKay, F. S. Mottled Teeth: An Endemic Developmental Imperfection of the Enamel of the Teeth Heretofore Unknown in the Literature of Dentistry. *Dental Cosmos*, 58:129, 1916.
12. Blayney, J. R., Kesel, R. G., and Wach, E. C. Dental Caries. I. New Method of Studying Bacterial Plaque. *J. Dent. Research*, 15:326, 1935.
13. Bodecker, C. F., and Ewen, S. The Incidence of Unilateral Dental Caries in 516 Cases. *J. Dent. Research*, 16:401, 1937.
14. Cheyne, V. D. Human Dental Caries and Topically Applied Fluorine: A Preliminary Report. *J. Am. Dent. A.*, 29:804, 1942.
15. Clarke, J. K. On the Bacterial Factor in the Aetiology of Dental Caries. *Brit. J. Exper. Path.*, 5:141, 1924.
16. Cox, G. J. Nutrition and Dental Caries in Rats. Abstracts, Sub-Sect. Dentistry, Am. Assoc. Advancement Sci., 1938.
17. Cox, G. J. New Knowledge of Fluorine in Relation to Dental Caries. *J. Am. Water Works A.*, 31:1926, 1939.
18. Cox, G. J. The Fluorine and Dental Caries Problem. *J. Am. Dent. A.*, 27:1107, 1940.
19. Cox, G. J., Matuschak, M. C., Dixon, S. F., Dodds, M. L., and Walker, W. E. Experimental Dental Caries. IV. Fluorine and Its Relation to Dental Caries. *J. Dent. Research*, 18:481, 1939.
20. Day, C. D. M. Oral Conditions in the Famine District of Hissar. *J. Am. Dent. A.*, 31:52, 1944.
21. Dean, H. T., Arnold, F. A., Jr., and Elvove, E. Domestic Water and Dental Caries. V. Additional Studies on the Relation of Fluoride Domestic Waters to Dental Caries Experience in 4,425 White Children, Aged 12 to 14 Years, of 13 Cities in 4 States. *Pub. Health Rep.*, 57:1115, 1942.
22. Dean, H. T., Jay, P., Arnold, F. A., Jr., McClure, F. J., and Elvove, E. Domestic Water and Dental Caries, Including Certain Epidemiological Aspects of *L. acidophilus*. *Pub. Health Rep.*, 54:862, 1939.
23. Eager, J. M. Denti di Chiaie (Chiaie Teeth). *Pub. Health Rep.*, 16:2576, 1901.
24. Gies, W. J., and Kligler, I. J. Chemical Studies of the Relations of Oral Microorganisms to Dental Caries. 2. A Biochemical Study and Differentiation of Oral Bacteria with Special Reference to Dental Caries. *J. Allied Dental A.*, 10:141; 282; 445, 1915.
25. Goadby, K. W. Microorganisms in Dental Caries. *J. Brit. Dental A.*, 21:65, 1900.
26. Hartzell, T. B., and Henrici, A. T. The Pathogenicity of Mouth Streptococci and Their Role in the Etiology of Dental Diseases. *J. Nat. Dent. A.*, 4:477, 1917.
27. Hill, T. J. The Influence of Saliva upon the Growth of Oral Bacteria. *J. Dent. Research*, 18:214, 1939.
28. Hodge, H. C. Some Dietary Studies on Rat Caries. *J. Dent. Research*, 23:207, 1944.
29. Howe, P. R., and Hatch, R. E. A Study of the Microorganisms of Dental Caries. *J. Med. Research*, 36:481, 1917.
30. Jay, P. The Problem of Dental Caries with Relation to Bacteria and Diet. *J. Pediat.*, 8:725, 1936.
31. Kendall, A. I. Observations on Aciduric (Acidophilic) Bacteria. *J. Med. Research*, 17:153, 1910.
32. Lilly, C. A. Failures to Produce Experimental Dental Caries in the White Rat with High Carbohydrate Diet and *Bacillus Acidophilus* or with Vitamin D Deficiency. *J. Nutrition*, 5:175, 1932.
33. Lilly, C. A., and Associates. Report of Experimental Work on the Relation of Dietary Deficiencies to the Etiology of Dental Caries in Albino Rats.

Abstracts, Sub-Sect. Dentistry, Am. Assoc. Advancement Sci., 1938.

34. McClure, F. J. Domestic Water and Dental Caries. III. Fluorine in Human Saliva. *Am. J. Dis. Child.*, 62:512, 1941.

35. McIntosh, J., James, W. W., and Lazarus-Barlow, P. An Investigation into the Etiology of Dental Caries. I. The Nature of the Destructive Agent and the Production of Artificial Caries. *Brit. J. Exper. Path.*, 3:138, 1922.

36. McKay, F. S. in *Dental Caries*. Advisory Committee on Research in Dental Caries. American Dental Assoc., New York, 1941.

37. Miller, B. F. Inhibition of Experimental Dental Caries in the Rat by Fluoride and Iodoacetic Acid. *Proc. Soc. Exper. Biol. & Med.*, 39:389, 1938.

38. Miller, W. Der Einfluss der Mikroorganismen auf die Caries der menschlichen Zähne. *Arch. Exper. Path.*, 16:291, 1882.

39. Miller, W. D. Caries of the Human Teeth. *Independent Practitioner*, 4:629, 1883.

40. Miller, W. D. *Die Microorganismen der Mundhöhle*. Leipzig, 1889; (*The microorganisms of the human mouth*.) Philadelphia, 1890.

41. Miller, W. D. The Presence of Bacterial Plaques on the Surface of Teeth and Their Significance. *Dental Cosmos*, 44:425, 1902.

42. Moro, E. Ueber die nach Gram färbbaren Bacillen des Säuglingsstuhles. *Wien. klin. Wchnschr.*, 13:114, 1900.

43. Morozzo, C. L. Sopra i denti fossili di un

elefante trovato nelle vicinanze di Roma. *Memorandum. Mem. mat. fis. soc. Italiana sci.*, 10:162, 1803.

44. Niedergesass, K. Anatomische, bacteriologische und chemische Untersuchungen über die Entstehung der Zahnkaries. *Arch. f. Hyg.*, 84:221, 1915.

45. Rodriguez, F. E. Studies in the Specific Bacteriology of Dental Caries. *Military Dental J.*, 5:199, 1922.

46. Sieberth, O. Die microorganismen der kranken Zahnpulpa, Thesis, Erlangen, 1900.

47. Smith, M. C., Lantz, E., and Smith, H. V. The Cause of Mottled Enamel. *Science*, 74:244, 1931.

48. Sperling, H. Der Streptococcus lacticus (Kruse) in seiner Beziehung zur Zahnkaries. *Deutsch Monatschr. f. Zahn.*, 40:129, 1922.

49. Theriault, E. J. Water, Sewage, and Sanitary Chemistry. *Indust. Engin. Chem., News Ed.*, 9:105, 1931.

50. Volker, J. F. Effect of Fluorine on Solubility of Enamel and Dentin. *Proc. Soc. Exper. Biol. & Med.*, 42:725, 1939.

51. Williams, J. L. A Contribution to the Study of Pathology of Enamel. *Dental Cosmos*, 39:169; 269; 353, 1897.

52. Williams, N. B. Immunization of Human Beings with Oral Lactobacilli. *J. Dent. Research*, 23: 403, 1944.

53. Wright, H. D. The Effect of Iodoacetic Acid, Fluoride, Phloridzin and Phenol on Bacterial Fermentation: A Further Consideration of the Fermentation of Disaccharides. *J. Path. & Bact.*, 45:117, 1937.

# Signs of Progress in Dental Health\*

ALLEN O. GRUEBBEL, D.D.S., M.P.H., F.A.P.H.A.

*Executive Secretary, Council on Dental Health, American Dental Association, Chicago, Ill.*

IT is considered good practice to pause occasionally in the performance of our duties in order to take stock of our achievements or failures. When we make such an appraisal of efforts to prevent or control dental diseases, or to find a means of providing dental treatment for all persons who need dental care, it is easy to become skeptical of our chances to achieve these goals in our time. The almost universal distribution of dental disease in the population, and the limited preventive and treatment facilities available to combat these diseases, are not conducive to a high degree of optimism in the search for a satisfactory solution to the problem.

On the other hand, an evaluation of progress and an estimate of future achievements can be regarded in a more favorable and hopeful light when we take into account the relatively short period of time during which the dental and public health professions have studied and attacked the dental disease problem from a public health point of view. It has been only during recent years that we have begun to study the occurrence of dental disease according to accepted epidemiological standards, and have attempted to apply public health methods to the problem. While the accomplishments of the last few years are admittedly of modest proportions, the outlook for greater achievement in the years immediately ahead is certainly more favorable than it was 10

years ago. The extent of our progress during the next decade will depend in large measure on how fully we use our available facilities and knowledge, as well as on the development of new resources.

The American Dental Association, through its Council on Dental Health, unquestionably can make a contribution in this direction. The American Dental Association and its component societies are in position to carry out many activities that are important adjuncts to the total effort in dental health promotion and which could not be as readily undertaken by other agencies. For example, no other organization has an equal opportunity, or perhaps an equal responsibility, to conduct a longitudinal study of the dental health problem, to create an informed dental profession in matters related to dental health advancement, and to secure the coöperation of individual dentists and dental societies in community health planning. The Council on Dental Health has recognized the need for such action and is now engaged in the development of several projects designed to utilize more fully the resources of the dental profession in the promotion of dental health.

## DENTAL HEALTH WORKSHOP

There has been much discussion in recent months about plans which might be adopted nationally to provide a wider distribution of health care. At the moment it seems likely that proposals to expand local health services will receive more general support than will a nation-wide insurance plan. It is also

\* Presented before the Dental Health Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 12, 1946.

quite likely that the provisions of S.1099, which was introduced in the last Congress, may be adopted eventually in either a separate bill or as a part of other legislation. If funds become available to expand dental services for children, and to develop and maintain educational programs and demonstration projects, a mechanism will be needed to secure the support and advice of local agencies. Obviously, state and local councils on dental health should participate in the formulation of community dental health plans.

The A. D. A. Council on Dental Health intends to sponsor a series of workshops as a continuing activity, so that individual dentists and state and local councils on dental health may have an opportunity to consider the dental health problem in their own areas, and so that the dental profession may be in a better position to provide technical advice. Workshops have been used successfully for a number of years in the educational and civic improvement fields. In general terms, the purpose of the workshop is to bring together a group of individuals who are interested in solving a particular problem so that they can examine objectively all the facts which make up the problem and adopt recommendations for a plan of action. Usually a workshop is conducted for a period of one or more weeks, but since dentists would probably find it impossible to leave their offices for such a lengthy stay, the dental health workshops will be concentrated into three day meetings.

The three day conference will be divided into three major sessions. On the first day five or six speakers will present basic facts objectively; factual data will be outlined without an expression of personal opinion as to how the problem should be solved. The second day will be devoted to group discussions which would permit a more intensive examination of (1) the possi-

bilities of utilizing and expanding dental personnel and ancillary aids, (2) the establishment of desirable features of a community dental health program, (3) the establishment of responsibilities of groups and agencies for the promotion of dental health, and (4) recommendations for experimental or demonstration projects.

Through this procedure the members of the dental profession will have an opportunity to examine critically, through group discussions, a number of important questions, such as:

1. Is it desirable to increase dental personnel so that all persons who need dental service will receive it?
2. What methods should be adopted to secure an even geographic distribution of dentists in relation to the distribution of the population?
3. Should the Alabama plan of providing scholarships for dental students from each county be adopted by all states?
4. To what extent should the number of hygienists, technicians, dental nurses, and assistants be increased?
5. What should be the long-range objectives of a community dental health program?
6. What basic plans should govern the establishment and maintenance of dental health programs for the public?
7. Should a community dental health program include provisions for dental care?
8. If so, who should receive dental care in an organized plan? How should a dental care plan be financed? Should the dental care plan be limited to indigents? What criteria should be used to establish a means test?
9. What are the responsibilities of the dental profession in the organization and maintenance of a community dental health program?
10. What are the responsibilities of the city and county governments in supporting a dental health program?
11. What are the responsibilities of public school systems in promoting dental health?
12. What responsibilities can be delegated to lay committees?
13. What types of experiments or demonstrations conducted as community projects would aid in the adoption of methods for (a) preventing dental diseases, (b) educating the public in dental health matters, and (c) providing dental care for a larger number of people?



When the dental profession, through objective discussion and deliberation, has had an opportunity to study these questions, it should be in a better position to assist other health agencies in the establishment of community health programs. The Council on Dental Health believes that a continuing series of dental health workshops will prove to be very important and fruitful activities.

#### ANNUAL CONFERENCE OF STATE COUNCILS

As a projection of the workshop idea, conferences of state councils on dental health will be held during the annual meetings of the American Dental Association. Approval has been secured from the officers of the A. D. A. for the organization of annual conferences to be patterned after the State Officers' Conferences. These sessions will be planned to present and discuss the actions and findings of state councils on dental health. Through this procedure the state and component societies will have opportunities to exchange opinions and to enter into free discussions of the policies of the American Dental Association, as well as the national aspects of dental health planning.

The first annual conference of state councils will be held in Boston during the 1947 annual meeting of the American Dental Association. There is every reason to believe that the series of workshops and the annual conferences of councils will establish a mechanism for creating an informed dental profession and for securing active participation in dental health promotion.

#### SCHOOL DENTAL HEALTH MANUAL

The Council on Dental Health has recently prepared a manual to be used as a guide in the establishment and maintenance of dental health programs in elementary and secondary schools. This manual has been developed in

response to a considerable number of requests from members of state councils on dental health. The A. D. A. Council was informed that local dental groups could be of more direct service as members of school and community planning committees if reference material were made available to guide them in recommending policies and procedures for school dental health programs. The manual outlines accepted school health practices, organizational and administrative technics, and the responsibilities of dentists, school officials, health officers, and nurses in organizing and conducting school health programs. The manual has been submitted to public health dentists and other health workers for comment and criticism. The final revision is now being printed and will be available for free distribution soon.

#### DENTISTRY'S PARTICIPATION IN THE WORLD HEALTH ORGANIZATION

The International Health Conference held in New York City in June, 1946, resulted in a recommendation to establish a World Health Organization under the auspices of the Economic and Social Council of the United Nations. A number of technical advisers to the United States delegates were selected from the personnel of the Department of State, U. S. Public Health Service, American Medical Association, American Pharmaceutical Association, Bureau of the Budget, Federal Security Agency, and National Nursing Council.

While it may not have been practical to include at least one dental representative as an adviser to the United States Delegation attending the International Health Conference, it would be desirable to provide for dental representation during conferences of the World Health Assembly in the future. This would seem valid in view of the fact that dentistry is an integral part of any general health service and that many of the health problems which will come up

for discussion will encompass dental implications. This assumption can be applied specifically to the functions of the organization dealing with:

1. the promotion of coöperation among scientific and professional groups which contribute to the advancement of health,
2. the promotion of maternal and child health and welfare,
3. the promotion of research in the field of health,
4. the promotion of improved standards of teaching and training in public health, medicine, and related professions,
5. the study and report, in coöperation with other specialized agencies, of administrative and social technics affecting public health and medical care from preventive and curative points of view, and
6. the creation of an informed public opinion among all people on matters of health.

In recognition of the fact that the prevention and control of dental diseases constitute an essential part of a total health program, and therefore, that competent dental representatives should be available to the participants in the World Health Assembly, the American Dental Association has recommended the appointment of dental representatives from each of the member nations as dental advisers to the delegates.

This recommendation will be filed with the officials of the World Health Organization and the officials of the United States Government within the very near future.

#### DENTAL HEALTH GOALS

The deliberations of the Council on Dental Health have revealed that the objectives of the American Dental Association for promoting dental health have not been revised since the adoption of the recommendations proposed by the National Health Program Committee in 1939. The Council has decided that much could be gained by a restatement of the objectives based on the conditions and trends of today. This has resulted

in the following statement of goals approved by the House of Delegates during the meeting in October 1946:

1. The prevention of dental diseases through the application of preventive technics as soon as they are demonstrated to be scientifically valid; the support of intensified dental research with adequate funds, personnel, and facilities.
2. The control of dental diseases by the expansion of community dental programs, integrated into the general health program, to provide every child with dental care and dental health education, regardless of income or location. These programs should be maintenance programs centered on the control of the annual increment of new dental diseases in children.
3. The provision of additional facilities and uniform standards for dental care by making dental services available in hospitals and health centers for inpatients and outpatients.
4. The recruitment of an annual enrollment of dental students equal to the capacity of all dental schools to increase the number of qualified dentists.
5. The adoption of measures to make dental practice in smaller cities and rural areas more attractive and rewarding in order to secure a better distribution of dentists.
6. The employment of dental hygienists as ancillary aids to the dentist; the provision of adequate training courses and training facilities for dental hygienists to prepare them as ancillary aids within prescribed legal limitations, and additional courses for those who desire to qualify for positions in public health departments and schools.

The statement dealing with the approval of dental hygienists as ancillary aids represents the first official action of the American Dental Association in recommending that suitable dental hygienist practice acts be established in all states.

#### DECENTRALIZATION OF AUTHORITY

It has been the common experience of dental health workers that the use of a means test to determine eligibility for dental service at public expense almost always becomes an issue in planning for

community dental health programs. Congress is being confronted with the same question in considering legislation which provides for grants-in-aid to the states. It will be recalled that the Taft Bill, S.2143, specifically required the inclusion of a means test in the approval of state plans. The Children's Bureau Bill, S.1318, specifically provided that a means test should not be used in making health services available to mothers and children in programs financed by funds under this Act.

For a number of years the American Dental Association has maintained that the community in all cases shall determine the methods for providing service within its area. In further support of this policy, the American Dental Association recently reaffirmed its stand by adopting a resolution providing that the decision on the employment of a means test in public health programs should be delegated to the state or community and should not be incorporated into federal legislation.

#### AUTHORITATIVE DENTAL INFORMATION

For a number of years dentists have commented on the many inaccurate and misleading statements on dental health matters which appear in public school textbooks. Frequently textbooks contain information directly at variance with that which appears in health education literature distributed by the dental profession. In order that this situation may be remedied as far as possible, the American Dental Association intends to augment its services to publishers by employing a competent dental health education specialist who will be assigned the task of editing and evaluating the dental context of publications for school children.

#### REMUNERATION FOR PUBLIC HEALTH DENTISTS

Realizing that the effectiveness of dental health programs administered by

official health agencies will depend in large measure on the caliber of public health dentists employed by those agencies, the Council on Dental Health has been deeply concerned by the fact that a large number of qualified public health dentists have resigned their positions with state and municipal health departments. There can be no question that the chief reason for these resignations has been the opportunity for more adequate remuneration in other fields. In an effort to correct this situation, The Council on Dental Health will attempt to secure the assistance of state dental societies in taking suitable action, through legislative measures if necessary, to obtain higher rates of pay for dental positions in state and local health departments.

#### HEALTH PRACTICE INDICES

The Committee on Administrative Practices of the American Public Health Association publishes a record of public health practice which is compiled from evaluation schedules submitted by local health officers. It is unfortunate that the accomplishment of workers in the dental health field are reported so ineffectively in these *Health Practice Indices*. Dental health activities cannot be judged accurately nor can their effectiveness be fairly measured by the presently used appraisal forms. The Central Office of the American Public Health Association has recently invited the A. D. A. Council on Dental Health to suggest an improved method of recording activities and results. The Council believes that this matter should be referred to public health dentists, and is therefore requesting the Dental Health Section of the American Public Health Association and the American Association of Public Health Dentists to assist in the adoption of recommendations for improving the dental health evaluation schedule for use in the study and appraisal of community health programs.

## CONCLUSION

The above considerations outline the current actions and proposals of the Council on Dental Health. There is every reason to believe that, if the projects prove as successful as the Council hopes, the dental profession will be taking increasing interest in utilizing more adequately all of the available resources toward the promotion of dental health.

# An Epidemic of Diarrhea in a New-Born Nursery Caused by *Pseudomonas aeruginosa*\*

CHARLES A. HUNTER, PH.D., F.A.P.H.A., AND  
PAUL R. ENSIGN, M.D., M.P.H., F.A.P.H.A.

*Director of Laboratories, and Director, Division of Child and Maternal Health,  
State Board of Health, Topeka, Kans.*

THIS report deals with an epidemic of diarrhea in infants that occurred in 1945 in the St. Rose Hospital (135 beds) at Great Bend, Kans., (10,000 population). The State Board of Health was notified of this epidemic on October 1. Investigation revealed that there had been occurrence and recurrence of diarrhea in the nursery and in infants dismissed from the nursery since June. Information was also obtained that there had been cases of diarrhea in the community and neighboring community for several months.

There were 24 infants who had either developed this disease in the hospital nursery, or had developed it after leaving the nursery, and then had returned to the hospital. In these 24 cases, there were 9 deaths. During this period of time there had been 278 births in the hospital.

Out of the 24 cases, considered in this report, 15 developed in the nursery, while 9 cases had been discharged from the hospital and returned. Of these 9 cases, 7 gave history of contact with a case of gastroenteritis at home; one returned to the pediatric ward because of feeding difficulty and 7 days later developed diarrhea, simultaneously with

the development of several cases in the nursery. The ninth case developed symptoms the day it left the hospital. A total of 19 probably contracted the disease in the hospital.

Diarrhea was the first, and often the only symptom, which might vary from a few soft frequent stools to extreme watery ones. The next most common symptom was vomiting, then dehydration, cyanosis, collapse, pain and fever, in that order. In 3 infants who died, early and extreme setting of the muscles in rigor mortis occurred. In many of the cases, diarrhea seemed to be recurrent over periods of time as great as 6 weeks, just as it was in some of the adult cases. The period of incubation varied from 1 to 7 days, most commonly 6. Only one case had an onset less than 4 days after birth; the onset in this case was 3 days.

From the epidemiological study the following points can be noted:

1. There were 6 outbreaks in the nursery with the development of from 1 to 6 cases in each outbreak.
2. These outbreaks were separated by periods of 15, 7, 49, 31, and 10 days.
3. In each outbreak, all the primary cases in the nursery occurred in one or two consecutive days. There were no secondary cases except that possible August outbreak.
4. Prior to every outbreak in the nursery, except the one in August, one mother or nurse on the obstetric floor developed the disease. In the August and October outbreaks, mothers

\* Presented before the Laboratory Section of the American Public Health Association, at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 12, 1946.

had had the disease shortly before entering the hospital.

5. In every case where the mother had had the disease, her infant developed it.

6. One mother who did not have diarrhea came from a family in which two children did.

7. Several cases of gastroenteritis developed in other parts of the hospital, in medical, in pediatric, and surgical cases, and in 24 nurses and Sisters.

The hospital nursery had been very crowded of necessity, housing three times the number of infants it was built to accommodate. A proportionately large number of premature infants was in the nursery. A shortage of professional personnel existed. Consequently, there were some breaks in technic, but they were not gross breaks which would explain the epidemic.

The nursery outbreaks can be explained on the basis of secondary infection from infected mothers or nurses. It was proved that they were carriers of the organism causing the infection. The only condition which would cause such a large group of carriers is the ingestion of a contaminated food or water.

In addition to the infected mothers or nurses, there were several hundred cases of diarrhea in the community (histories were obtained on more than 400 which occurred between July 1 and October 15), and several cases occurring in outlying communities. The hospital, the city, and the outlying communities, had separate water supplies.

The only foods common to the hospital and city, which were not cooked before use in the hospital, were bread, lettuce, cold meats, and milk. The only persons who developed diarrhea in the outlying communities were using pasteurized milk from a dairy in Great Bend which also supplied the hospital. Only 21 of the 24 mothers could be contacted, but the one food all 21 used at the hospital was milk. Two of these developed diarrhea before entering the

hospital, but they bought milk from the same dairy.

From an epidemiological standpoint, a contaminated milk supply which had never been adequately controlled was the source of the infection. Milk for 90 per cent of the community came from 2 dairies which was labelled pasteurized milk. Inspection revealed both to be filthy, filled with flies; to have dogs in the milk room; to lack handwashing facilities; to have dust blowing in; to have no recording thermometers on the pasteurizing vats, and in one dairy a rag had been tied over a leak in a water pipe directly over the cooling coils. From this rag, water dripped into the pasteurized milk. *Pseudomonas aeruginosa* was isolated from the water dripping off of the rag. A heavy collection of milkstone on the pipes testified to the fact that they had not been properly cleaned for months. The bacteriological examination of the milk which consisted of the standard plate count, microscopic examination, coliform determinations, and phosphatase tests showed that more than 22 per cent of the samples of pasteurized milk from plant A had a standard plate count of over 3,000,000. Pasteurized milk from plant B had an average Standard plate count of 110,000. The phosphatase tests showed that 7 per cent of the samples from plant A were insufficiently pasteurized, and 23 per cent of the samples from plant B were not sufficiently pasteurized.

There were three different sources of water for the community; hospital, city, and private wells. The hospital had its own water supply and bacteriological examinations showed the water to be free of coliform organisms and *Pseudomonas aeruginosa*.

The city water supply (17 samples) did not show the presence of coliform or *Pseudomonas aeruginosa*. It is chlorinated continuously and tested regularly under the supervision of the

State Board of Health. It is estimated there are some 1300 private water supplies in Great Bend. Upon inspection by the sanitary engineers, none were found cross-connected to the city water. Seventy-two samples of water from private wells were examined and coliform organisms found in 16 of them. *Pseudomonas aeruginosa* was isolated from 4 wells.

The bacteriological study of the cause of illness and deaths of infants in the St. Rose Hospital, Great Bend, was started on October 1, 1945. A complete laboratory was set up in the hospital and 3 bacteriologists from the State Public Health Laboratories were assigned to study this epidemic. Stool specimens were obtained from all sick and some normal infants; from hospital nurses and employees; from mothers, and from residents of Great Bend that were sick or had recently been sick. Rectal swabs were used to collect the specimens except in some cases of the infants. The stools were plated directly on SS agar, MacConkey's agar, and desoxycholate agar. Tetrathionate broth and Selenite F broth were also used as enrichment media. All suspicious colonies were fished off into Kligler iron agar. These cultures were then sent to the Central Public Health Laboratories, Topeka, where complete study and identification were made.

Because of the clinical symptoms of the disease in some infants, and of the history of a sick father who returned by airplane from overseas, efforts were made to isolate all types of organisms, even *Vibrio comma*. Although *Pseudomonas aeruginosa* was isolated from the first case seen on October 1, it was difficult to believe this was the etiological agent, therefore, every effort was used to isolate all other possible organisms. Streptococci, both aerobic and anaerobic, were looked for in addition to the above mentioned group of organisms. Besides isolating *Pseudomonas aeruginosa* from

the infants, it was also possible to extract pyocyanine from the stools. More than five hundred stool specimens were examined.

#### Summary of Bacteriological Examinations

1. Infants under 2 years of age.....	38
<i>Pseudomonas aeruginosa</i> isolated.....	24
2. Infants followed clinically.....	24.
Number studied bacteriologically.....	9
<i>Pseudomonas aeruginosa</i> isolated.....	9
3. Normal infants studied.....	13
<i>Pseudomonas aeruginosa</i> isolated *.....	5
4. Autopsies on infants.....	2
<i>Pseudomonas aeruginosa</i> isolated from liver, spleen, gall bladder, and intestines.....	2
5. Rectal swabs on nurses and hospital employees	103
<i>Pseudomonas aeruginosa</i> isolated.....	16
<i>Eberthella typhosa</i> isolated.....	1
<i>Shigella alkalescens</i> isolated.....	2

\* Four of the 5 infants became sick later and 1 left the hospital and could not be followed, but *Pseudomonas aeruginosa* had been isolated from the mother.

In addition to the results given above, a large number of *Proteus* and *Salmonella*-like cultures were isolated which were classified as belonging to the paracolony group. More than seven hundred cultures were studied. The identification consisted of cultural, biochemical, and typing for antigenic characteristics.

It is interesting to note that nurses in the nursery and pediatrics were carriers of *Pseudomonas aeruginosa*. Another finding of interest was the isolation of *Eberthella typhosa* from one of the nurses.

#### TREATMENT

The treatment before isolation of the organism had consisted of penicillin, transfusions, parenteral fluids, and sulfa drugs; the last two were the most effective. Following isolation of *Pseudomonas aeruginosa*, a review of the literature revealed that it produced small amounts of hydrocyanic acids. It was conceivable that the symptoms could be attributed to slow poisoning from this source. Proceeding upon this assumption, methylene blue—which had often been used effectively in this type of poisoning, was suggested as a treatment. One of the physicians used it and reported miracu-

lous results with clearing of cyanosis and signs of toxicity in less than 10 minutes. This affords a therapeutic test which supports the rest of the work.

#### MEASURES TAKEN TO STOP THE EPIDEMIC

1. The hospital autoclaved all milk until a safe milk supply could be obtained.

2. Whenever possible, stool cultures were made on mothers 2 weeks before they entered the hospital. Upon entry, another stool culture was made and the mothers were questioned concerning a history of diarrhea.

3. Whenever a positive stool culture was obtained, or the mother had a history of diarrhea within the past 2 weeks, or developed diarrhea on the obstetric floor, the mother was isolated on a separate floor, and the infant was taken from the nursery and also isolated from the mother. If a history of diarrhea or a positive stool culture was obtained before entrance, the mother was delivered in her own room.

4. When an infant developed the first suspicious sign of diarrhea, the mother and infant were isolated as above, and the physician notified so that treatment might be started on the infant.

5. Another room was set up for a nursery and all new infants placed in this room until all the infants in the original nursery had been discharged and the nursery could be thoroughly cleaned.

6. All mothers and infants were sent home on the fourth day routinely. The public health nurse was notified when the mother and infant were dismissed from the hospital so that a visit could be made to give the mother instructions on the care of the baby and techniques which should be used to prevent infection. If, on the fourth day, the infant showed signs of diarrhea, he was sent to pediatrics rather than home. If, for some reason, the mother or infant had to stay in the hospital more than 4 days, the mother and infant were placed in a private room and the infant kept out of the nursery.

7. Public health nurses were assigned to assist mothers leaving the hospital with new-born infants, to put into practice every precaution to safeguard infants from infection.

8. Stool cultures were repeated on all nurses in the nursery, and pending report, all nurses who had had diarrhea in the last month were removed from the nursery.

The epidemic subsided within 3 weeks after these measures had been put into effect.

#### SUMMARY

1. This is a report of an epidemic of diarrhea in 24 new-born in which there were 9 deaths. Eighteen of these probably contracted the disease in the new-born nursery. One was discharged, returning to the hospital as a feeding problem, and developed diarrhea 7 days later. Five developed diarrhea at home after being in contact with a case in the family.

2. The infecting organism was *Pseudomonas aeruginosa* which gained entrance to the milk supply through water which was dripping off of a rag into the pasteurized milk in one dairy. Bottles of dairies were exchanged without proper cleaning and sterilization, so that the organisms easily gained access to the other dairies.

3. The contaminated milk caused an epidemic of gastroenteritis in Great Bend and caused outbreaks among patients and employees of the hospital and in consumers of the Great Bend milk in outlying towns.

4. The infants were secondarily infected by mothers and nurses who drank the milk in the hospital, or by other members of the family after the infants had been dismissed from the hospital.

5. Apparently well persons who had ingested the contaminated milk acted as temporary carriers.

6. Of 24 infants studied clinically, it was possible to study 9 bacteriologically. *Pseudomonas aeruginosa* was isolated in the stools of all 9. Autopsy material was obtained from 2 cases for bacteriological study and *Pseudomonas aeruginosa* was isolated from both.

7. Epidemiological, milk sanitation, and bacteriological studies, all support this conclusion which is further supported by the therapeutic results of methylene blue.

8. The epidemic subsided within 3 weeks after control measures based upon the findings were put into effect.



# American Journal of Public Health

## and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 37

September, 1947

Number 9

### Editorial Board

REGINALD M. ATWATER, M.D.  
*Chairman and Managing Editor*

LEONA BAUMGARTNER, M.D.  
MARTIN FROBISHER, JR., D.Sc.  
PROFESSOR JOHN M. HENDERSON

RALPH S. MUCKENFUES, M.D.  
STUART MUDD, M.D.  
RAYMOND S. PATTERSON, Ph.D.

C.-E. A. WINSLOW, Dr.P.H.

C.-E. A. WINSLOW, Dr.P.H., *Editor*

AUGUSTA JAY, *Editorial Associate*

## THE FORGOTTEN MIND

IT is an accepted truism that the health problems related to mental and emotional maladjustment are approximately equal in volume to all the other health problems which confront us. We know that the number of hospital beds occupied by advanced cases of mental and nervous disease nearly equals the number assigned to all other diseases and defects. We know that the burden placed on the average family by emotional maladjustments—fears, inhibitions, suspicions, insecurities, defense reactions of various sorts—are probably as heavy as those due to all types of so-called “physical” diseases in the home. We give lip service to these facts; but what do we do about them? How much serious thought have you, Dr. Health Officer, who read this editorial, really given to the problem in your community? Are you its Health Officer, or only its Physical Health Officer? Can you shrug your shoulders and leave the problem to the psychiatrists? How vital in your thinking, Miss Public Health Nurse, are the problems of mental hygiene which arise in your daily practice? What has the American Public Health Association contributed to this cause? How far does the attention devoted by this *Journal* to the subject of Mental Hygiene, reflect the real importance of the subject and how far is it bound by the inertia of past routine practice in the field of public health?

The U. S. Public Health Service and a few state health departments have stepped out and assumed real leadership; but most of us have failed to act on the assumption that this is really a basic and fundamental responsibility of our profession.

The passage on July 3, 1946, of the National Mental Health Act brings the issue clearly home to us. This law, it will be recalled, provides for erection and equipment of a research institute to be operated by the U. S. Public Health Service as a center for experimentation and specialization in this important field and for grants to outside research centers for the same purpose; for training of essential personnel in the mental hygiene field; and grants to aid in the establishment of mental health clinics for discovery, diagnosis, and treatment of persons with psychiatric disorders. The 80th Congress has provided an appropriation of approximately three millions for the first steps in carrying out the purposes of this Act.

If you feel that this matter does not concern you as public health workers, and as citizens, we recommend a serious perusal of the *Annual Report of the National Committee for Mental Hygiene* for 1946.<sup>1</sup>

Let us begin with the problem of institutional care, since historically this has always been our first community avenue of approach. The National Committee points out that about 1,000,000 persons in the United States are sufficiently disabled by mental illness to warrant hospitalization, but that only half that number receive such care. And what is the character of the care which the fortunate half million actually enjoy? Here are some pertinent points brought out by the National Committee in regard to state mental hospitals:

- "(a) Some of our states spend as little as forty cents a day, all told, per patient;
- (b) some state hospitals spend on food only seventeen cents a day per patient;
- (c) many state mental hospitals are crowded to almost twice their capacity;
- (d) mentally ill persons are often housed in buildings long since condemned because there is no money available for new structures."

Is it any wonder that the standards of the staffs of such hospitals tend to reflect the deplorable picture of neglect and mismanagement which these statements reveal? There are twenty times as many unfilled medical posts in our state hospitals as there are physicians willing to take such posts.

That conditions are not far different across our northern border is indicated by a recent article<sup>2</sup> which points out that in Canada, public mental hospitals are expected to provide board, lodging, clothing, and medical and nursing care for a budget of about one dollar per capita.

Now as to facilities for the outpatient service provided for child guidance and for the treatment of the adult who does not yet need institutional care. This is the most fundamental and most constructive part of our mental hygiene machinery. By clinic treatment, a certain proportion of cases otherwise headed for institutional care will be kept out of the state hospitals; but—what is much more important—thousands of persons are restored to happiness and efficiency who would never, perhaps, be sent to an institution but who would drag out their lives in wretchedness as a burden on family and community.

On this point the National Committee reports that there are 25 states in which not even one child guidance clinic is in existence; and that in the entire country there are less than 400 such clinics. The *Report* notes that only 50,000 boys and girls could get assistance from child guidance clinics in 1946, while over 250,000 teen-agers passed through our juvenile courts. The National Committee estimates the real need of the United States as 1,400 clinics; and points out that "if each outpatient clinic prevented the commitment either of one veteran with a service-connected disability or five civilians a year, more than the estimated cost of operating a clinic (\$32,000 per year) would be saved."

Since Clifford Beers published *A Mind That Found Itself*, in 1908, we have made notable progress in our thinking about the problems of mental health; but our accomplishments in the field of concrete achievement are not much to boast about as the result of four decades. If the public health profession were really to put its shoulder to the wheel, thought might more rapidly be translated into action.

#### REFERENCES

1. National Committee for Mental Hygiene, 1790 Broadway, New York 19, N. Y.
2. Angus, L. R. *Canad. Pub. Health J.*, 38, 4-157 (Apr.), 1947.

## PROGRESS IN THE USE OF FLUORINE FOR THE CONTROL OF DENTAL CARIES

WE have reviewed in an earlier editorial<sup>1</sup> some of the basic evidence presented by Bibby, Dean, and others in regard to the use of fluorine for the reduction of dental caries. More recent findings—along two different lines—warrant a discussion of the progress made during the past three years.

The simplest and most comprehensive method of applying this preventive is the addition of minute amounts of sodium fluoride (one p.p.m.) to a public water supply. One report on this subject has come from Connecticut. Erlenbach and Tracy<sup>2</sup> compared 187 children in an institution where fluorine was added to the water supply with 149 children in another institution used as a control. After a one year experimental period, the "caries attack rate" was 3.0 per cent and 4.3 per cent in the respective groups, a 30 per cent lower incidence of new carious teeth in the group receiving fluorine. The children in the fluorine series were older, however, on the average and had a high incidence of caries at the outset of the experiment. The difference in new carious teeth may well have been due merely to the fact that the experimental group had already progressed farther along the road of the normal development of caries with age, or as a result of some other physiological variable between the groups.

This is a most important point. Klein,<sup>3</sup> in a study of children of Japanese ancestry, reported that at ages between 8 and 10, a group of children supplied with fluorinated water showed (in 2 years) 13 per cent of new decayed or filled teeth against 31 per cent for a control group; while for children between 11 and 14 years, the respective ratios were 11 per cent and 15 per cent. It seems probable that the effect of fluorinated water is most significant in early years. We must await the results of extensive studies now under way at Grand Rapids, Mich., and Newburgh, N. Y., for a more complete answer to this question.

A second method of applying fluorine is that of "topical application." This consists in giving the teeth a thorough prophylaxis, isolating the teeth to be treated by cotton rolls, drying the teeth thoroughly, painting their dried surfaces with 2 per cent sodium fluoride, and allowing the painted surfaces to dry. A carefully controlled series of experiments with this procedure has been reported by Knutson and Armstrong,<sup>4</sup> in which age and physiological variables were ingeniously controlled by treating only teeth in one upper and one lower quadrant of the mouth. The treatments were applied in 7 to 15 topical applications (to those quadrants) during a period of 8 weeks in the spring of 1942—and 242 subjects have been under observation for 3 years. Results in the upper and lower quadrants were quite consistent and the following general results were obtained for the treated quadrants.

<i>Year</i>	<i>Per cent Less Newly Carious Teeth</i>	<i>Per cent Less Newly Carious Surfaces of Previously Carious Teeth</i>
1942-1943	40	12
1943-1944	47	25
1944-1945	22	33

Whether the decreased improvement in newly carious teeth and the increased improvement in new areas on previously carious teeth is significant is uncertain. With the passage of time, the number of non-carious teeth available to become carious must, of course, decrease. In general, however, the results are encouraging.

It appears that thorough and repeated topical application of fluorine reduces the development of caries by 30-40 per cent; and that the influence of this treatment persists for at least 3 years.

Jordan and Knutson and their associates<sup>5</sup> have recently reported detailed studies of the effect of varying the number of topical applications and of omitting prophylactic treatment prior to application. The per cent reduction in caries incidence recorded was as follows:

	Treatments				
	1	2	3	4	6
Jordan, with prophylaxis	5	10	21	..	..
Knutson, without prophylaxis	..	9	..	20	21

Knutson concludes that the preliminary prophylaxis should be an essential part of the procedure.

Fulton and Tracy have suggested that it might be preferable to make the topical application once every 6 months instead of 7 to 15 times within a short period as was the practice of Knutson. They report a one year experiment on this procedure and compare the results with those of Knutson's first year for two selected age periods, with respect to reduction in caries incidence:

	Age	
Knutson	7-10	47
Fulton	5-10	52
Knutson	11-15	60
Fulton	11-14	53

The question as to the number and spacing of topical applications must be determined by further studies. It seems reasonably clear, however, that topical application is a highly effective procedure; that it should be preceded by a thorough prophylaxis; and that—whatever may be the case with the consumption of fluorinated water—this process is effective with older children.

There is still a third method of applying fluorine, intermediate between its addition to drinking water and its intensive topical application. This is the use of a fluoride mouth wash as a part of the daily tooth toilet. Individuals have claimed highly satisfactory results from this procedure in their families, but we know of no statistical study which has scientific validity in this field. It is still uncertain whether fluorine in a water supply exerts its influence directly on the teeth or through absorption and circulation of the salt to the teeth indirectly. If the latter process is involved it would explain the fact that major effects in this case are produced on the young child. On the other hand, topical application must apparently operate directly on the tooth through its surfaces and this is in accord with its efficacy in older children. It is not easy to see how the use of a mouth wash could produce results anything like as efficient as topical application; and the latter would seem to be, at present, the method of choice. We trust that the dental profession will work out the best procedure as promptly as possible; and we recommend to health administrators and health educators consideration of the inclusion of this procedure in their programs.

It should be noted that the Divisions of Dental Health of Massachusetts and Connecticut and other states are strongly advocating topical application of fluorides. "On March 15, 1947, the American Dental Association published a report in the *American Dental Association Journal* stating, 'The demonstrated relation between the presence of fluorides in domestic water supplies and the

prevalence of dental caries in children has led directly to experimental studies on the effect of the topical applications of various fluorides to teeth. These studies, although not uniform in methods of findings have demonstrated the effectiveness of topically applied fluoride solutions in reducing the incidence of dental caries in children under certain conditions. Considerable research still remains to be done in determining the optimum frequency and method of such applications, but the use of topically applied fluorides by the dentist can now be recommended as a general preventive measure.'"

The number of dentists, even in the United States, is about half the number necessary to care for the present incidence of dental decay, and the ratio of dentists to population has remained between 50 and 60 per 100,000 population since 1920; there were 25 per cent less dental graduates between 1930 and 1940 than in the previous decade. Only a reduction of some 40 per cent in incidence of dental caries could bring this situation into balance; and such a reduction seems a possibility if topical application of fluorine becomes general. The treatment could be organized under public health dentists so that dental hygienists in a clinic would provide treatments at a minimal cost. This may well become an important factor in the public health program of the future.

#### REFERENCES

1. Editorial. *A.J.P.H.*, 34:528 (May), 1944.
2. Erlenbach, F. M., and Tracy, E. T. Control of Dental Caries by Artificial Fluorination of a Water Supply. *Connecticut Health Bull.*, 60:203 (Sept.), 1946.
3. Klein, H. Dental Caries Experience in Relocated Children Exposed to Water Containing Fluorine. *Pub. Health Rep.*, 60:1462 (Dec. 7), 1945.
4. Knutson, J. W., and Armstrong, W. D. The Effect of Topically Applied Sodium Fluoride on Dental Caries Experience III. Report of Findings for the Third Study Year. *Pub. Health Rep.*, 61:1863 (Nov. 22), 1946.
5. Jordan, W. A., Wood, O. B., Allison, J. A., and Irwin, V. D. The Effects of Various Numbers of Topical Applications of Sodium Fluoride. *J. Am. Dent. A.*, 33:1385 (Nov. 1), 1946.

## MYSTERIES OF MEAT INSPECTION

**D**ID you know that you can determine whether a lobster was dead when it was boiled by bending its tail back straight and seeing whether it snaps back into place or not? At what point of said lobster's anatomy should you sniff to determine whether his tissues have become decomposed?

Did you know that you should examine the side of a mackerel, the backbone of a halibut, the eyes of a cod, to determine its degree of mortuary decomposition?

Did you realize that pressure due to forcing meat through a chopping machine too fast, or the chopping of pieces that were too large, or the piling up of meat on a counter during trimming, could produce appreciable increases in temperature, favorable to decomposition? Would you have imagined that a tactful campaign of education could reduce the average bacterial content of chopped meats in a city from 10 million to 200,000 per gram?

The Editor did not know any of these things until he talked recently with the Inspector of Meat and Provisions in a New England city.<sup>1</sup> He came away from the conference with a new reverence for the occult arts of the meat inspector.

#### REFERENCE

1. Joseph Morin, Springfield, Mass., Department of Health.

# Clearing House on Public Health Salary Information

THE following caution is suggested for readers: in any recommendations for salaries for various public health personnel made by the Executive Board of the Association or by its Sections or committees, or by other agencies such as the public health nursing salaries recommended by the National Organization for Public Health Nursing in the June Clearing House, it is understood that, because of the cost of living or prevailing salary levels in other professions in any particular community, the recommended salaries may not be high enough. It is a truism that no single average or median figure of any kind will be applicable to the entire United States.

## INCREASED SALARIES FOR ENTERING POSITIONS IN NEW YORK STATE

One of the early announcements to come out of the New York State Health Department following the appointment of the new Health Commissioner, Herman E. Hilleboe, M.D., was of higher salaries to physicians qualifying for the entering position of either Assistant District Health Officer or Senior Public Health Physician.

In announcing these increases, Dr. Hilleboe said:

"We fully realize that even with the recent increases in the salary scale, the pay the department can offer well trained physicians is still not as much as we would like and considerably less than such physicians can make in private practice, but it should attract those physicians who are more interested in helping to prevent unnecessary human suffering than in treating illness which has occurred. The increases granted

will partially compensate these physicians for the increased cost of living, and help to meet the competition of local and federal agencies, such as the Veterans' Administration."

## WHAT KIND OF EMPLOYERS ARE WE?

The June *Bulletin* of the National Tuberculosis Association in "What Kind of Employers Are We?" by Edward Funkhouser, raises some questions that might well be pondered as a part of the salary problem, which is after all one aspect of the larger problem, that of securing and holding personnel. The questions raised are:

1. Is there a fair salary policy—fair both in relation to other employees of the agency and to going rates for community jobs of comparable responsibility?

2. Is fair personal treatment for the individual assured through a clear statement of policy as to salary, working conditions, vacations and sick leave, as well as a method of dealing with grievances?

3. Are opportunities for advancement provided and are employees aware of these opportunities and encouraged to prepare themselves to meet them?

4. What are working conditions? Mr. Funkhouser points out, for example, that among tuberculosis associations there is a wide gap between the number of employees enrolled in a retirement plan and the total number of workers. He suggests other security routines such as preemployment, physical examinations, and routine check-ups. He also suggests the value of good tools and good supervision.

## INDEX NUMBERS OF INCOME AND COST OF LIVING

The Clearing House has received the following figures on the relative rise in the cost of living, in the incomes of private physicians, public health physicians, and nurses and in the wages of

## INDEX NUMBERS OF INCOME AND COST OF LIVING

*For Public Health Physicians and Nurses, Physicians in Private Practice, and Industrial Workers*

	<i>Date</i>	<i>Index Number</i>
Consumers Price Index (Cost of Living)	Feb., 1947	152.8 <sup>1</sup>
Average Weekly Earnings of Workers in all Manufacturing Industries	Jan., 1947	197 <sup>2</sup>
Average Net Income of Physicians Practising as Specialists	1943	191 <sup>3</sup>
Average Income of Public Health Nurses	Jan., 1947	130 <sup>4</sup>
Average Income of Public Health Physicians	Mar., 1946	127 <sup>5</sup>

1. *The Handbook of Basic Economic Statistics*, 1947 Edition with supplements. Government Statistics Bureau of Washington, D. C. 631 Pennsylvania Ave., Washington, D. C. March Supplement, p. 13.
2. *Ibid.* p. 30 of 1947 Edition; p. 6 of March Supplement.  
1939—Average weekly earnings \$23.86  
Jan., 1947: Average weekly earnings \$46.94.
3. 1939 level \$6,184—The incomes of specialists. *Medical Economics*, 18:47-51, Sept., 1941.  
1943 level \$11,808—Specialists' economic status. *Medical Economics*, 23:50-54, Oct., 1945.
4. 1938 level \$1,484—Borowski, A. J. Positions and Rates of Pay in Public Health Agencies. *A.J.P.H.*, 28:1197-1202, Oct., 1938.  
1947 level \$1,928—Heisler, Anne (U.S.P.H.S.). Communication dated Mar. 19, 1947. Average salary for vacancies as public health nurse and junior public health nurse in all types of agencies as of Jan. 1, 1947.
5. 1938 level \$4,214—Borowski, A. S. Positions and Rates of Pay in Public Health Agencies. *A.J.P.H.*, 28:1197-1202, Oct., 1938.  
1946 level \$4,750—Palmer, Geo. T. Some Problems in the Training of Personnel. *California's Health*, 4:142-144, Mar. 31, 1947.

workers in manufacturing industries, with the notation that they are of interest to the current discussion.

We agree that they are interesting and that they advance our thesis that public health salaries are too low. We wish to point out, however, qualifications that should be borne in mind in drawing conclusions from them.

In the first place, the nature of index numbers must be remembered—that they are not absolute and cannot be related absolutely to each other. They rather represent the distance that each factor has traveled from its respective base line. They do not mean that wages of workers in manufacturing industries are higher than public health salaries; they mean only that manufacturing wages increased faster than public health salaries.

A second factor that must be remembered is that not all starting dates are the same. The later date for salaries of public health physicians is a year

earlier than in the other categories. In that year, the general level of salaries of public health physicians undoubtedly increased, thus raising the index that is comparable with the other groups to a figure beyond 127.

#### LOCAL AND STATE HEALTH PROGRAMS CURTAILED BY REDUCED APPROPRIATIONS IN WASHINGTON STATE

The following article from Washington State's *Health Commentator* for May, 1947, suggests the presence of still another threat to the current campaign to get public health salaries on a level that will attract well qualified persons. Perhaps another area of education needs to make clear the distinction between real and "Taberized" economy.

"Local health departments throughout the state, faced with a 50 per cent cut in state subsidy funds, are either seeking additional money locally or have

trimmed their staffs and are putting away plans for bettering health services.

"The funds available for state aid to local departments were slashed from \$264,226.50 for the 1945-1947 biennium to \$125,000 for the 1947-1949 biennium.

"Elimination of this aid has made it necessary for 49 positions to be either dropped from the payrolls or paid for by local sources. Some of these positions are unfilled vacancies on the staffs, due to the shortage of trained health workers; others represent trained public health workers who have been released from their jobs.

"The 49 vacated positions include 32 public health nurses, 6 clerks, 7 sanitarians, 2 bacteriologists, 1 health educator, and 1 dental hygienist.

"In addition to personnel cuts, plans for improving local health services, such as developing full-time departments in place of inadequate part-time units, are being shelved. Only 22 counties are now receiving full-time health services, and plans for full-time departments in Whatcom and Grays Harbor counties are being postponed unless money can be raised locally.

"Salary funds for the State Health Department were cut from \$675,358 to \$564,000, although the requested budget was more than twice this amount. This cut necessitated dropping 22 positions from the state staff, as well as tabling plans for expansion in many important fields such as mental hygiene, sanitation, health education, and industrial hygiene.

"The State Health Department's operations budget was increased \$38,270, but this was largely consumed by an increase of \$36,275 in Smith Tower rent rates. Allowing for increased costs of materials and supplies, substantial cuts will also be required in this field.

"Positions dropped from the state staff include 3 physicians, 10 clerical workers, 2 consultant nurses, 1 health educator,

2 statistical workers, 1 venereal disease investigator, and 2 sanitarians. All employees of the department are hired under rigid State Merit System specifications, and personnel practices are entirely removed from partisan politics.

"Services for crippled children also are being curtailed, as the appropriations for this work were reduced from \$239,495 to \$180,400 for the next two years. Due to increased costs of hospitalization and the reduced budget, fewer children needing help can be accommodated during the next two years."

#### WHAT THE READERS SAY

Apropos of the article in Washington's *Health Commentator* are two communications from that state.

Arthur L. Ringle, M.D., State Health Officer writes:

The Washington State Legislature does not appropriate individual salary items for health department workers, but appropriates a lump sum for "salaries and wages." The cost of living bonus passed by the Legislature in 1945 was incorporated in the Compensation Plan as an integral part of the salary ranges. We feel that our salary ranges are inadequate to attract and retain qualified personnel in our health organization. This opinion is substantiated by a rather complete salary survey which was recently made by the Washington State Personnel Board.

Our Merit System Rule does permit us to employ persons with training and experience above the minimum requirements at a rate above the entrance rate. We have been forced to resort to this procedure in attracting experienced personnel, although we feel that such action is not entirely in conformity with the true spirit of a merit system.

Emil E. Palmquist, M.D., Seattle Health Officer writes:

It is with great interest that I have read the editorials appearing in the May and June issues of the *Journal* relative to salaries being paid public health professional personnel. It is most timely to bring this to the attention of public health administrators. I only wish that public officials who hold the purse strings would be more cognizant of the need for raising salaries. I have used some



of the material from your editorials to stimulate local officials into providing better salaries, especially for physicians of the department. The salaries for public health nurses, sanitarians, and public health engineers, are fairly well up but so far I do not have the physicians' salaries in a good position. At present the physicians' salaries in this department, other than my own, are \$6,180 and \$6,300 annually. Transportation is furnished by means of the City providing an automobile for their use in connection with their work.

I am still looking for an Epidemiologist to head the Division of Acute Communicable Disease Control. The salary for the position is now \$6,180 plus transportation. There is a possibility that this position might also carry an appointment in the new University of Washington Medical School. I am asking the City Council to establish a salary range for these physician-division directors of \$7,200, \$7,800 and \$8,400. They must have specialized training in public health plus training in their particular specialty. The other three positions of this rank are now filled by well qualified public health men, namely, Director, Division of Maternal and Child Health Services, Director, Division of Venereal Disease Control, and Director, Division of Tuberculosis Control.

I am wondering if you can give me any assistance in finding a qualified Epidemiologist. I would prefer to have a younger man who has one year of postgraduate training in public health with specialization in communicable disease control or epidemiology. Experience is desirable but not required.

From about the middle of December until the middle of May, I had an Epidemiologist of good training and qualifications lined up to take the vacant position. He was still in the Army and I expected his release momentarily. About the time his release was due, he accepted another position at an annual salary of \$8,100 in the Civil Aeronautics Administration. This was quite a shock to me since I had been counting on him to come for the \$6,180 annual salary. I have related this experience to the officials in charge of the purse strings locally, but will not know for another two or three months whether I have made sufficient impression to get any substantial increases for next year. To say the least, I am somewhat discouraged about salaries for physicians in public health, and the prospects for the future do not seem to be too good.

You might be interested to know that Dr. John Fouts, the King County Health Officer, resigned effective July 1, 1947. We are now

attempting to effect a consolidation of the City and County Health Departments for this community; namely, the City of Seattle and King County. I do not know yet what the outcome will be but the idea has the blessing of the Medical Society and also of the Seattle Municipal League. I shall let you know when I have any definite information.

**EDITOR'S NOTE:** The last paragraph is included here advisedly to remind readers that city-county consolidations are closely related to the salary and personnel shortage situations.

*V. L. Ellicott, M.D.*, County Health Officer of Montgomery County, Maryland, writes as follows:

The Health Department of Montgomery County, Maryland, now employs twenty public health nurses. On July 1, 1947, the following salary scale went into effect:

Junior Public Health Nurse (11 positions) . . . . .	\$2,400
Senior Public Health Nurse (3 positions) . . . . .	\$2,600
Assistant Supervising Nurse (2 positions) . . . . .	\$2,800
Supervising Nurse (3 positions) . . . . .	\$3,200
Director (1 position) . . . . .	\$3,600

All positions carry three increments of 5 per cent each, which are given at 6, 18, and 30 months respectively, after appointment.

The position of Junior Public Health Nurse does not require university study. The position of Senior Public Health Nurse requires at least 14 and preferably 28 credits (one year of Public Health Nursing). Several of the supervising positions carry administrative responsibilities beyond those of nursing supervision. This accounts for the relatively high ratio of supervisors to staff nurses.

The new salary scale represents an increase of approximately \$500 over the old scale. The principal reasons for the increases were:

(a) Higher salaries are being paid to public health nurses by other agencies in the metropolitan area of Washington.

(b) The former salaries were little higher than clerical salaries and therefore offered little inducement to high school graduates to spend three years in training.

(c) Teachers' salaries have been markedly increased. Nurses' salaries should be approximately equal to those of teachers because the period of training is approximately the same.

The Civil Service status of public health nurses has been changed from subprofessional to professional.

*J. Lynn Mahaffey, M.D.*, Director, New Jersey State Department of Health, writes:

The salaries paid to employees of this department are in accordance with ranges established by the State Civil Service Commission. A system of yearly increments is in force. The compensation plan at present applying was established in December, 1944.

**Physicians:** A well qualified and experienced industrial physician in the Division of Adult and Industrial Health left the employ of this Division because of inadequate salary. He was receiving \$4,500 per annum and was offered \$7,500 in the same field with a large insurance carrier.

**Nurses:** The Chief of the Department's Division of Maternal and Child Health reports increasing difficulty in the past several months in securing nurses to fill positions in the field of maternal and child health. The salary established for the position of Public Health Nurse in this state is \$1,800 per annum. While nurses have accepted positions at this salary, they soon leave. At least four have left to take full-time school positions starting at \$3,100 a year; several have accepted institutional positions at \$2,400 a year. Two nurses are considering positions in other states; one was offered \$2,850 and the other \$3,000. In other instances nurses interested and about to accept a position with the division, refuse to work for the \$1,800 salary as they can receive better income in institutional, industrial, or other branches of nursing.

**Engineers and other employees of the Bureau of Engineering and Sanitation:** Resignations among engineering personnel in recent months number four: three started at \$1,800 with a range up to \$2,280 as hydrobiologist or watershed inspector in 1931, 1939, and 1940, respectively. Their rank was changed to assistant sanitary engineer with a salary range of \$2,400 to \$3,000. In 1944 each was raised to the rank of sanitary engineer with a salary ceiling of \$3,600. Each left in 1946 for more lucrative pay. An additional engineer at the same pay left for the same reason after seven years as assistant sanitary engineer at \$1,800 to \$2,280 and two years as sanitary engineer at \$3,000 to \$3,600. A fifth who was certified by Civil Service did not accept the position of sanitary engineer at \$3,000-\$3,600, and a sixth, that of junior sanitary engineer, at \$2,040-\$2,640 because of the low salary range.

**Laboratory Personnel:** Two Junior Laboratory Technicians have left the Bureau of Bacteriology because of salary limitations, and there is general dissatisfaction with salaries among technical employees in the Bureau.

**X-Ray Technicians:** The entrance salary of \$1,680 per annum is insufficient to attract competent technical personnel for the Division of Tuberculosis Control. As a result, it is necessary to employ untrained and unqualified persons. After persons are trained, they are offered salaries double the amount paid by the state, and resignation ensues.

**Pharmacologist:** The Bureau of Food and Drugs recently lost a particularly well qualified pharmacologist because, upon his return from military service, he secured a position with a drug manufacturing firm at an entering salary of \$5,500 per year, as contrasted with the \$3,000 salary in the department. No other satisfactory candidate has been secured because of the low salary.

**Veterinarians; Food Inspectors:** Two veterinarians employed in milk control work and two food and drug inspectors have also been lost because of insufficient salary.

**Health Education Workers:** In the original plan of work for the Division of Health Education there was contemplated the employment of a person who would be trained in still photography to take still pictures as needed for exhibits, news releases, lantern slides, and other uses in health education activities. The salary set by the State Civil Service Commission was \$1,800, which none of five well qualified applicants would consider. The individual who finally accepted the position proved unsatisfactory and was dismissed. Another accepted the position; while his service along certain lines was satisfactory, he was not capable of doing good photographic work. He subsequently left for a better paying position.

Multilith operators receive an entering salary in state service of \$1,440, which has proved inadequate for securing and retaining qualified persons.

The administrative and technical staff of the Division of Health Education report offers of positions in other agencies and in commercial organizations at better salaries. It is feared that economic pressure may eventually bring about the loss of these employees.

# Credit Lines

## NEW HOME FOR LOS ANGELES HEALTH DEPARTMENT

George M. Uhl, M.D., and David Janison, Health Officer and Director of Health Education respectively of the Los Angeles City Health Department, have prepared this story of how citizens of that city were persuaded to vote a \$6,500,000 bond issue to finance construction of new public health facilities:

On May 27, 1947, the voters of Los Angeles approved a \$6,500,000 municipal bond issue to finance the construction of new public health facilities. It was the first time in the city's 156 year history that the health department was granted an adequate and suitably constructed home of its own. From the time of its creation, the health department has been alternately housed—clinics, laboratory, and all—in a succession of outmoded structures no other governmental agency would have. Two address changes in past years were entirely accidental. The first came when the telephone company delivered an ultimatum to the city to provide rainproof offices for the health department or lose its telephone equipment. So the health department was told to close up its umbrellas and cram itself into one of the oldest buildings in the city, which workmen soon after came around to tear down for the new city hall. Again the health department was moved, this time to a ten story bank-and-office building as a "temporary measure." Twenty-one years later, when the voters approved the \$6,500,000 bond issue, the department was still in its "temporary quarters."

The passage of the bond issue marked a turning point in Los Angeles's public health history. How the city administration successfully convinced the bond-shy voters of Los Angeles that the issue was essential, is a story of extremely close coöperation between all the city departments, the press, radio, and civic groups, and of a strenuous effort on the part of city employees themselves.

*Decision for a Bond Issue*—Much of the post-war planning for expansion of municipal services, including public health, fire and police protection, combustible rubbish incinerators, playgrounds, and sewer improvements, were worked out by the heads of city departments, the City Council, and the Mayor. Altogether, \$55,500,000 was estimated as necessary for the

expansion, and bond issues for the separate items were decided upon.

*The Campaign*—Six propositions, covering each of the municipal functions to be expanded by bond issues, were placed on the ballot. A citizens' committee was formed to promote all the issues. Each city department urged support of all propositions; but gave special emphasis to its own bond issue. The citizens' committee was late in getting started, primarily because of the difficulty of raising funds. Finally, the committee succeeded in raising enough money to begin placing billboards, radio spot announcements, small newspaper advertisements and news publicity.

Nearly 2 months before the elections, a delegation composed of the Mayor, the Fire Chief, Police Chief, City Engineer, and Health Officer, visited newspaper editors, radio managers, labor organizations, and representatives of the motion picture industry to elicit support. As a result, the newspapers took an active part in the campaign, and the motion picture industry produced a 4 minute trailer which was exhibited in more than 200 movie theaters for 10 days preceding the election. Radio stations devoted a considerable part of their broadcast time to special spot announcements, dramatizations, and eye-witness reports of the city's limitations. Service clubs held special programs. Hundreds of thousands of pieces of literature, none printed at city expense, were distributed. The slogan on all centrally distributed literature and material was, "Vote Yes on Propositions A through G." Although receiving all this extra mention, Proposition G, which was to have financed the expansion of branch city halls, was defeated even in those districts which it was to benefit. Significantly enough, it was the only proposition which had no additional "educational" support and it was the only proposition defeated.

The health department, on the other hand, through the off-hours contribution of its employees and executives, gave its Proposition F all the "educational" support it could muster. It drew up a graphic handbill, with photographs of an old-time Wild West type of structure contrasted with the city's only modern district health center. Citizens were shocked to learn that both structures were serving the same purpose, and that in the Wild West building a nurse had recently fallen through the floor. Posters were drawn up, support by various organizations was enlisted, talks by the dozen were given, and leaflets

were distributed wherever crowds could be found, in front of public buildings and sports stadia. Thousands of personal post cards were mailed to friends by employees. Newspapers were given every "assistance" possible in their coverage of the department's antiquated facilities, including pictures of the health officer and his secretary lighting up the gas fixtures in his office, which were still intact although modified for use of electricity, and crews trapping rats elsewhere in the building. A running supply of stories pointing up the need was prepared and gradually released to the more than 100 newspapers circulating in the city. Still photographs were prepared for inclusion in the movie trailer. In the words of newspapermen and radio executives, the health department "got more than its share" of publicity.

*The Results*—Bond issues require a two-thirds majority of votes to be passed, so that opponents can defeat them with a 33.3 percent "No" vote. Because enough "educators" could not be mustered, the proponents decided to let Proposition G coast along on its mention in the campaign slogan. On election night, the earliest returns showed "G" trailing, while the public health proposition, together with fire, police, incinerators, playgrounds, and sewers came through comfortably, and continued to do so until all votes were in. The final count on health bonds was 203,112 for, 88,917 against.

Los Angeles, in the not too distant future, will have a new central headquarters and 6 new district offices for its health department. The voters, having seen how handicapped the department was, felt it would be worth \$6,500,000 plus interest for 20 years to modernize its facilities. And when the city itself begins to realize the benefits of this expenditure, it can thank its health department employees, who gave their own time and money to broadcast the need.

#### WHAT DO WE KNOW ABOUT REHABILITATION?

The field of rehabilitation and services to the handicapped assumed increasing importance in the period between the two world wars. New governmental and voluntary agencies concerned with rehabilitation sprang up and many already existing health and welfare agencies included rehabilitation activities in their programs. This trend has been greatly accelerated during World War II and the post-war period, due

both to the programs of the armed services and Veterans' Administration and to the effort made by industry to overcome the man power shortage by employing handicapped workers.

Public health workers have become increasingly aware of the importance of rehabilitation in relation to the public health field. Knowledge of the agencies concerned with rehabilitation and services to the handicapped constitutes an essential tool for public health workers; yet the number of health and welfare, educational, and other agencies engaged in some form of rehabilitation activities has made it increasingly difficult to keep well informed.

In appreciation of this difficulty presenting itself to workers in component activities, Dr. Howard Rusk and Eugene J. Taylor have compiled *A Directory of Agencies and Organizations Concerned with Rehabilitation and Services to the Handicapped* (published as a public service by the *New York Times*, price 10¢). The *Directory* lists national organizations and agencies as well as some local agencies. The listings include the name, address, and the name of the executive officer of the organizations as well as a description of the structure, membership, source of funds, program, scope of activities, and publications.

The 133 page booklet will be a valuable addition to health department libraries and many public health workers will wish to keep it on their desks for convenient and frequent reference.

#### SOCIAL SCIENCE RESEARCH COUNCIL "ITEMS"

With the March, 1947 issue, *Items* of the Social Science Research Council began publication as a quarterly, or oftener if it fills a need. It is intended to be a report of current activities of the Council and grows out of a conviction that there is urgent need for clearer understanding of the role of the social

sciences on the part of the public. Address Social Science Research Council, 270 Park Avenue, New York 17, for information about subscription rates.

#### HISTORY OF TUBERCULOSIS CONTINUED

*The American Sanatorium Association: A Brief Historical Sketch* is the third in the historical series by which the National Tuberculosis Association hopes to get into a permanent record the story of the men and movements by which tuberculosis has been brought under control. Written by Lewis J. Moorman, M.D., who has been Director of the Oklahoma Cottage Sanatorium since 1914, and was President of the National Tuberculosis Association in 1933-34, it is the story of Dr. Trudeau and the forces he set in motion which have led to present-day tuberculosis sanatorium practices. Available from state and local tuberculosis associations at \$1 a copy.

#### RECONSTRUCTION TOWARD EUROPEAN HEALTH

While the brass hats thunder and the power politicians scramble for temporary advantage, various auxiliary organizations of the United Nations go ahead with the fundamental but often undramatic tasks of building a healthy world which alone can serve as a prelude to a peaceful world.

The latest evidence of such a task comes in the notice of an FAO mission to Poland during July and August to survey the country's major agricultural problem, with particular reference to the nutritional level of the population.

The members of the mission are:

Chairman—Noble Clark, Director of the Agricultural Experiment Station, University of Wisconsin

Nutrition and food management—Dr. M. J. L. Dols, Professor of Nutrition, University of Amsterdam

Crop husbandry and marketing—T. J. Harrison, Assistant Commissioner, Canadian Board of Grain Commissioners

Live stock husbandry and marketing—Profes-

sor James Morrison, Queens University, Belfast, and Professor Aksel Milthers, Royal Veterinary and Agricultural College, Denmark

Marketing and preservation of perishable products—Paul Findler, U. S. Department of Agriculture

Preservation of trees—E. N. Munns, U. S. Forest Service

Agricultural economist—Dr. Mordecai Ezekiel, Head of the Agricultural-Industrial Branch of the FAO Marketing and Economics Division

Secretary and rapporteur—Dr. A. B. Lewis, FAO Agriculture Division

#### THE CASE FOR A FEDERAL DEPARTMENT OF HEALTH, EDUCATION AND SECURITY

Late in 1946, the American Council on Education and the National Social Welfare Assembly jointly sponsored a Committee to study the question as to whether an executive Department of Health, Education and Security, with a cabinet officer at its head, was in the public interest, and to determine what basic principles should be incorporated if such a department were desirable.

The report of this committee was recently published. It gives an excellent summary of the arguments for and against the creation of such a department and outlines the basic principles of legislation creating it. This report should be very useful as background for decisions as to whether to support such legislation in the next session of Congress.

Address, National Social Welfare Association, 1790 Broadway, New York 19.

#### PUBLIC WELFARE'S STAKE IN REORGANIZING LOCAL GOVERNMENT

*Public Welfare*, the monthly journal of the American Public Welfare Association, in June, 1947, published an article, "Health and Welfare's Common Concern with the Multiplicity of Local Government." Written by Martha Luginbuhl, Research Assistant of the APHA's Subcommittee on Local Health

Units, this points out that effective administration of public welfare, no less than of public health, requires a broader base than the town or village. *Public Welfare* is to be congratulated on recognizing the urgency of this problem and on giving space to a discussion of the county or the multi-county district as a unit of health and welfare administration.

#### "BETTER HEALTH" MAKES ITS DEBUT

In December, the North Carolina Social Hygiene Society which had just been chartered under state law, began the publication of *Better Health*, an ambitious bi-monthly journal. It is a part of "the current popular and official movement for the building of hospitals and health centers in the state," which is also reflected in the Good Health Association and the Commission on Medical Care of the state. Nor is this movement confined to professionals—Kay Kyser has lent his name and his talents to make North Carolina health conscious.

#### MINNESOTA DISCUSSES LOCAL PUBLIC HEALTH SERVICES

The University of Minnesota Center for Continuation Study recently held a two day Continuation Course in Community Activities for Public Health Services.

There were three main panel discussions; one each on the importance of local health services, how to keep our public health nursing programs going, and how we can improve school health. On the panel for the first mentioned were a local health officer, a state district engineer, a county nurse, a local health educator, a representative each of the Minnesota Council of Social Agencies and the Minnesota State Medical Association, and the Secretary of the State Committee on Local Health Services.

This is an interesting illustration of

the several interests that must be brought together in developing community planning for local health services.

#### SEEING AN OVERWORKED HEART, IN ACTION

The Chicago Heart Association combined health education and a plea for funds in a unique demonstration at a recent luncheon meeting with 85 business executives in the Chicago area. Four hearts were displayed in a bottle: one a normal heart; one a heart about twice normal size belonging to a newspaper executive who had a stroke while arguing with an assistant; a third of a department store executive who would not follow doctor's orders to slow down, and whose distorted heart was puffed like a toy balloon; and the last of a man who had had a heart attack at 65, followed his doctor's orders to relax and died in his sleep at 80.

Louis N. Katz, M.D., Director of cardio-vascular research at Michael Reese Hospital, in presenting the demonstration, declared that one out of every two of the nation's professional men and executives die of high blood pressure or hardening of the arteries. The President of the Association, G. K. Fenn, M.D., asked for \$100,000 for research, saying, "It's a doctor bill, submitted in advance for the doctor bills that would be much larger and that we hope you never will have to pay."

#### MIGRANT LABOR

The Federal Interagency Committee on Migrant Labor, established in 1946, under authority of the Federal War Mobilization and Reconversion Act, has just made its report which it calls *Migrant Labor—a Human Problem*. It reports varying estimates of from one to five million agricultural and industrial migrants. These "forgotten people of 1947" are "unorganized, unprotected by workmen's compensation laws, ineligible for educational, health, or

welfare benefits . . . and frequently find maintenance of even a minimum standard of living an impossibility." But they are, nevertheless, basic to the nation's agricultural economy.

The committee makes a series of recommendations. Among them are safe transportation ("occupational accident and death rates are probably the highest for any major industry"), establishment of minimum wages, extension of workmen's compensation laws to migrant workers, compulsory school attendance for children, regulation of private employment agencies, and continuance and extension, as required, of the federally sponsored labor camps that have been a part of the national scene for a decade and that will be remembered as the grateful haven of the long-suffering Joads. It is a report that stresses human values but its 9 appendices are a thorough documentation as well. Available from the U. S. Department of Labor, Washington, D. C.

#### THE FIRST FIVE YEARS OF THE NUTRITION FOUNDATION

The Nutrition Foundation recently issued a report of the first five years of its work. Wholly supported by the food industry, it has appropriated more than a million and a half dollars in the five years. Sixty per cent of this sum was for basic research studies. Research grants have been made to 54 colleges, universities, and research institutes in the United States and Canada and have covered wide areas of nutrition problems. Nine per cent of appropriations were made for education and professional training.

The full report, *Research and the Science of Nutrition*, is available from the Nutrition Foundation, Chrysler Building, New York 17.

#### SEEING THE SIGHTLESS

The visual arts are heavily drawn upon in the 41st annual report of the

New York Association for the Blind called, *Their Future Is in Your Hands*. Not only is it an annual financial and activity report of this million dollar operation but even more it is a plea for treating the blind like human beings. The Department of Public Relations, which prepared the report, also develops exhibits, radio programs, news interviews to help the sighted in understanding the blind. It also manages the Lighthouse Players, a group of talented blind actresses whose public performances convince audiences that blindness is no deterrent to high adventure and courageous living. The Director of the Association, Philip S. Platt, Ph.D., and the Director of Public Relations, Louise S. Kintner, are to be congratulated on the report—its excellent pictography, photography, typography, and paper and the humanity of its approach.

#### "HEALTH RESOURCES" APPEARS

Volume 1, Number 1 (February, 1947) of *Health Resources* has arrived from the Marion County (Salem, Ore.) Department of Health. Due to the shortage of mimeograph paper, it is done on heavy green cover paper. It is a very simple but effective attempt to tell the Marion County public what services are available through its Health Department. It is another illustration of what can be done with simple tools and a little imagination and ingenuity.

#### ANTHRACITE DUST PROBLEM STUDY PUBLISHED

Adequate ventilation and the liberal use of water sprays are the 2 most effective ways to control coal dust hazards in anthracite mines and to protect workers from the respiratory disease known as anthracosilicosis, according to a 3 year wartime survey made by the Bureau of Mines in 38 collieries in the Pennsylvania anthracite region, recently published. The publication was pre-

pared by Leland H. Johnson, Bureau Mining Engineer with the Health and Safety Branch, Wilkes-Barre, Pa. It also covers routine dust sampling and analyzing, use of a wet-type pneumatic drilling machine, removal of dust from roadways, and the use of water in fighting mine fires and removing harmful gases from blasting.

Copies of Technical Paper 704, *Dust Problems in the Mines of the Pennsylvania Anthracite Region*, can be obtained *only* from the Superintendent of Documents, Gov. Ptg. Office, Washington 25, D.C., at 15 cents each.

#### UNESCO NEWS

On June 15, Vol. 1, No. 1 of *National Commission News* was published. It is the monthly organ of the U. S. National Commission for UNESCO (United Nations Educational and Social Council). It is a useful 8 page pamphlet for keeping informed of one of the United Nation's special commissions. The first issue gives a brief outline of the UNESCO program.

The Director General of UNESCO is Dr. Julian Huxley of the United Kingdom; the American member of the board is Milton Eisenhower, President of Kansas State College, and Chairman of the U. S. National Commission for UNESCO.

*National Commission News* appears to be available without charge from the Gov. Ptg. Office, Washington, D. C.

#### REPORTING ON NTA'S MILLION DOLLAR OPERATION

The 40 page 1946-47 *Annual Report of the National Tuberculosis Association* is a condensed story of the wide ranging activities of this 43 year old national organization with affiliated associations in each of the states and territories of the United States.

The year's activities are classified under public health, medicine, and research. The report shows an expansion

into broader fields than tuberculosis. Seven states are now also using seal sale funds for programs on heart disease, social hygiene, cancer control, diphtheria prevention, rheumatic fever, or dental hygiene.

The 1946 seal sale netted more than 17 million dollars of which all but 5 per cent was retained by the state and local associations that raised the amounts. The total income and expenditures of the national association alone were nearly a million dollars.

#### WORTH ACQUIRING

*Nursing Is a Good Profession*—In simple language and humorous illustrations this answers such questions as "How do I find out how to become a registered nurse, what do I need by way of education, how do I choose a school, what will it cost, and what are my opportunities after I graduate?" and many others that the high school student or her parents might ask in deciding upon a nurse career. This should be a valuable help in the current nurse recruitment program. Available from Nursing Information Bureau, 1790 Broadway, New York 19, at 5 cents each or \$4 per 100.

*Medicine's Fifth Column*, by Virgil H. Moon, M.D., Jefferson Medical College Professor of Pathology, has been reprinted from the *Ladies Home Journal*. It is a popular argument against the perennial attempts of antivivisectionists to get state laws passed prohibiting animal experimentation by medical scientists. Available from National Society for Medical Research, 25 E. Washington St., Chicago 2.

*A Digest of Nutrition Conferences*. This is a report of a series of nutrition conferences conducted by Stuart W. Adler, M.D., Director of the Maternal and Child Health Division of the New Mexico Department of Public Health, and Walter Wilkins, Surgeon (R), U.S.



Public Health Service in 1944. It was first published in 1945 as Vol. 12, No. 2 of the *New Mexico Health Officer* and a supply has now been reprinted. This material, representing an example of postgraduate education, is still of vital interest and is as up-to-date now in concept as when the conferences were held. Available from New Mexico Department of Public Health, Santa Fe, N. M.

*Growing Healthfully*—Prepared by Mabel Rugen, Professor of Health and Physical Education in the University of Michigan, and published by the National Tuberculosis Association, is a teaching unit for grades I–XII, attractively illustrated and includes a list of suggested publications and their source. Available from your local tuberculosis association.

## BOOKS AND REPORTS

*All reviews are prepared on invitation. Unsolicited reviews cannot be accepted. All books reviewed in these columns may be purchased through the Book Service.*

The Yale Journal of Biology and Medicine—C.-E. A. Winslow Number—New Haven, Conn.: Yale University, March, 1947, Vol. 19, No. 4. pp. 393-800.

It does not happen frequently that the Managing Editor of this *Journal*, responsible as he is for scanning some forty to fifty books each month and assigning them for review, seizes one with selfish pleasure and reserves it to himself. It almost never happens that the *Journal* reviews a special issue of a periodical. Both these departures from ordinary behavior are occasioned by the C.-E. A. Winslow Number of the *Yale Journal of Biology and Medicine*.

Thirty-nine contributions make up this Festschrift volume for Professor Winslow as he retires as Anna M. R. Lauder Professor of Public Health at Yale University and as Head of the Department. The diverse interests of these contributors reflect the extraordinary versatility of Professor Winslow who is not only a teacher of national and international influence but vitally interested in international health organization, in better administrative practice, in industrial hygiene, in voluntary health agencies, in public housing, in sanitary engineering, in epidemiology, in health education, in school health, in public health nursing, in medical care, in health insurance, in nutrition, in heating, lighting and ventilation, and in making public health a true profession.

As Dr. W. P. Shepard has said, it is not often that within the short span of one man's career he sees the emergence of his chosen field from an aggregation of specialists in various professions to a

profession in its own right. It is still more rare for one man to have had so much to do with that emergence. Professor Winslow has seen public health grow into a profession. No one individual has contributed more to this process of professionalization than he.

Among the contributors are Ira V. Hiscock, Thomas Parran, Sir Wilson Jameson, Philip S. Platt, Leonard Greenburg, John R. Paul, Howard J. Shaughnessy, Ruth Grout, Lucy Morgan, Franklin Foote, Charles Wilson, Martha Eliot, Louis I. Dublin, Leona Baumgartner, Hugh R. Leavell, and the late Courtney Smith. The final chapter represents a bibliography of Professor Winslow, including 574 items in addition to the extensive contributions he has made through such publications as the *New York State Health News*, the *Journal of Bacteriology* (Editor, 1916-1944), and his service as Editor of the *American Journal of Public Health* since April, 1944.

The industry and diligence of the persons who compiled the bibliography must be commended, inasmuch as Professor Winslow himself remarked that many references were turned up which he had entirely forgotten. The one way to have improved it would have been to assign someone to shadow this remarkable man through the years with the sole responsibility of recording for posterity the innumerable gracious and erudite acknowledgments, introductions, and responses made without benefit of manuscript and that are now lost except to those who heard them and remembered.

Altogether this is one of the most successful Festschriften that have come to

the reviewer's attention. It is not only well made up and representative of Professor Winslow, but it is a fine volume in itself worthy of a place in every library. REGINALD M. ATWATER

**Medicine in the Changing Order.** *Report of the New York Academy of Medicine, Committee on Medicine and the Changing Order.* New York: Commonwealth, 1947. 240 pp. Price, \$2.00.

Shortly after it came into being in 1942, the New York Academy of Medicine's "Committee on Medicine and the Changing Order" (Malcolm Goodridge, Chairman) defined its objectives as follows: "To be informed on the nature, quality, and direction of the economic and social changes that are taking place now and that are clearly forecast for the immediate future; to define in particular how these changes are likely to affect medicine in its various aspects; to determine how the best elements in the science of medicine and in its services to the public may be preserved and embodied in whatever new social order may ultimately develop."

The Committee was comprised of some 33 physicians and 17 representatives of allied professions and lay persons. Nursing and dentistry were represented. The lay members were drawn from the ministry, the law, social welfare, the hospital, insurance, labor, and industry. The work of the Committee was given financial support by the Commonwealth Fund, the Milbank Fund, and the Josiah Macy, Sr. Foundation.

The Committee sought information and opinion from a wide variety of authorities. Subcommittees were appointed to organize and study the material thus obtained and to make special investigations of medical education; graduate and postgraduate medical education; the internship; the hospital; administration of public health services; extension of medical services;

the cost of diagnostic and consultant services; industrial medicine; rural medicine; nursing and dentistry. Under the aegis of the Committee some 10 authoritative monographs have been published which contain much of the factual material upon which the Report of the Committee is based.

In this brief review of the Committee's report it is not possible even to list its conclusions and recommendations, much less discuss them. About all that can be done is to point out that the study was planned thoughtfully and skillfully and that it was carried out expertly and with courage and objectivity. It is presented as a judicial, unbiased and constructive study of conditions pertaining to the problems of providing adequate medical care throughout the country. It will be accepted as such by judicious, unbiased readers. It ventilates and illuminates controversial areas of medicine and medical care which are often overheated and poorly lighted. Readers who are genuinely interested in the subject "Medicine and the Changing Order" cannot afford to miss this report. Those whose interest is centered upon preserving the *status quo* will find little in it to encourage them.

HUGH J. MORGAN

**Manual for Public Health Nurses—1947–1948.** *Minneapolis: Division of Public Health Nursing, Minneapolis: Minnesota State Department of Health.*

This manual covers all areas of public health nursing. It is arranged in two parts, administration and nursing activities. The table of contents with page numbers is an invaluable aid to the reader.

The material is introduced with a discussion of the relationship of the public health nurse to the state and local boards of health and it follows a logical presentation throughout. An admirable feature is the inclusion of per-

tinent records and forms with appropriate topics.

A diagram of the organization of the Minnesota Department of Health includes agencies with which the department coöperates. However, the State Department of Education is not listed.

Wider range of participation in program planning by all agencies concerned with health promotion than was indicated in several sections of the manual is desirable. A loose classification of certain agencies, professional organizations and other groups occasionally appears.

The authors of this manual are to be commended for this generally constructive contribution to public health nursing. Minnesota's public health nurses are fortunate in having this clearly defined and comprehensive manual as a guide in their work.

LULA P. DILWORTH

**Penicillin: Its Practical Application**—By Sir Alexander Fleming. Philadelphia: Blakiston, 1946. 380 pp. Price, \$7.00.

The volume under review consists of a group of individual articles prepared by British authors, and deals with various phases of the clinical application of penicillin. Only the preface and a short chapter are Fleming's.

The preface reflects the character of the author in that it frankly draws attention to the fact that the clinical reviews are prepared on the basis of information available at the time of writing and that viewpoints will change as experience is accumulated. The volume will probably serve as a chronicle of the status of progress up to the date of publication.

As a reflection of current opinion it probably will not have many adherents. The warning against the indiscriminate use of the antibiotic is timely. Possibly Fleming might have further emphasized the dangers which may accrue from

the promiscuous use of the product in conditions in which the causative organisms are not identified or in which other forms of treatment are known to be effective. Not only is this practice unsound but it may have the effect of reducing the efficacy of penicillin in patients confronted by a lethal emergency caused by pathogens which would have been susceptible under ordinary circumstances.

JOHN F. MAHONEY

**Rehabilitation Through Better Nutrition**—By Tom D. Spies, M.D. Philadelphia: Saunders, 1947. 94 pp. Price, \$4.00.

This monograph is of timely value to public health physicians, nutritionists, and nurses as well as to private practitioners, medical students, and post-graduates for whom it is specifically planned.

Dr. Spies, a physician noted for outstanding research in nutritional deficiencies, succinctly describes the methods of diagnosis and principles of nutrition therapy which he has found so successful in rehabilitating hundreds of malnourished patients.

Emphasis is placed on the many factors present in nutritive failure and the four essential steps in treatment, including recognition of the time element. Diagnosis of vitamin and protein deficiencies and various anemias is followed by detailed description of therapeutic principles and results. Use of foods, synthetic vitamins and supplementary products is illustrated with four different meal plans.

Excellent photographs of clinical manifestations and simple charts of findings lend clarity and interest.

DOROTHEA E. NICOLL

**Public Health Nursing in Syphilis and Gonorrhea**—By Evangeline Hall Morris. Philadelphia: Saunders, 1946. 239 pp. 18 illus. Price, \$2.25.

The author states in the preface of her book that it is an "attempt to deal with current problems of the social hygiene program and to include related material which is of special interest." The book accomplishes these aims well and the author has given us a wealth of factual material about the venereal disease program in its broadest scope. The historical sidelights provide interesting background in understanding the many attitudes and misinformation about the diseases.

The chapter on Family Life Education deals with the prevention of the disease and the manifold implications.

The chapters on The Patient and His Needs, and The Work of the Public Health Nurse place emphasis on the need to treat the patient as an individual recognizing his many needs.

The bibliographies at the end of each chapter provide excellent references which will give the nurse more detailed information.

This brief volume provides an excellent reference book for public health nurses as well as all members of the professions. It will be especially valuable to students as a reference book.

HELEN E. WEAVER

**Teaching in Schools of Nursing—**  
*By Loretta A. Heidgerken, R.N. Philadelphia: Lippincott, 1946. 478 pp. Price, \$4.00.*

This book on principles and methods of teaching by an assistant professor of nursing at the Catholic University of America is well organized, simple, and specific. There are adequate topic outlines, summaries, and index. Extensive, authoritative references are listed at the end of each chapter. Principles set forth are those currently accepted as sound, and the methods proposed are in harmony with these principles.

At a time when nursing is undertaking a study of conditions affecting the quality of nursing education, Miss

Heidgerken calls attention to a crucial and often neglected point in the learning situation—the point where student and teacher meet. "The teacher determines the educational fate of her students by what and how she teaches." This concept of the teacher's part in the development of a good nurse is consistently maintained.

The book should prove useful for teachers and even more specifically for prospective teachers of nurses.

MARGERY T. OVERHOLSER

**State-Local Relations—Report of the Committee on State-Local Relations. Chicago: Council of State Governments, 1946. 228 pp. Price, \$3.50.**

With the shrinking of the world due to ever faster means of communication and transportation and with the social revolution of the last decade, the interrelationships of federal, state and local governments have of necessity also changed. Recognizing the need for clarifying these relations, the Council of State Governments in 1945 established a Committee on State-Local Relations to study the broad field and to develop a report with definite recommendations.

The present volume is the report of that committee's work. The general summary of the report and the summaries preceding each of the six chapters are excellent. Although the committee's recommendations are nowhere categorical and various alternatives are reasonably presented, the direction of necessary changes is nevertheless obvious.

The recommendations are definitely not in the direction of more centralized state government but rather for greater powers to local units of government. To reach this goal, however, the long run pattern of local government must undergo a fundamental reorganization. Changes in structure must look toward one local government for one local area, for a local government large enough in terms of population to permit effective

public services at low cost and wealth enough to support a substantial portion of those services. It suggests various ways of meeting these goals, the city-county consolidation, for example, in urban areas and consolidation of counties in rural areas. It estimates, for example, that two-thirds of all the counties in the United States have areas of less than 800 square miles which is suggested as a conservative size of convenience; nearly two-thirds of counties and 95 per cent of towns and townships have populations of less than 25,000.

This is a valuable reference work for anyone who must deal with various levels of government and particularly for the state official whose task is to further consolidation of local units. He will also find this bit of useful advice, "The persuasive devices of supervision are the most effective."

MARTHA LUGINBUHL

**A Medical Survey of the Bituminous Coal Industry: Report of the Coal Mines Administration—***Washington, D. C.: U. S. Government Printing Office, 1947. 224 pp. XXIV pp. foreword and preface. Supplement, 67 pp. Price, \$1.75.*

The study was made under the direction of Rear Admiral Joel T. Boone, Medical Corps, U. S. Navy, by a staff of naval officers, enlisted men and civilian technical advisers, pursuant to Section 5 of the agreement of May 29, 1946, made by J. A. Krug, then acting as Coal Mines Administrator of the U. S. Government (now Secretary of the U. S. Department of Interior), and the President of the United Mine Workers of America, John L. Lewis.

Under the terms of Section 5, the Coal Mines Administrator agreed to have made, "A comprehensive survey and study of the hospital and medical facilities, medical treatment, sanitary, and housing conditions in the coal mining areas. The purpose of this survey will

be to determine the character and scope of improvements which should be made to provide the mine workers of the nation with medical, housing, and sanitary facilities conforming to recognized American standards."

The bituminous coal industry is big industry. In 1946, more than 525½ million tons of bituminous coal were mined in the United States. The largest part of this was produced in eight of the states, but twelve other states also produced considerable amounts. In the year 1945, more than 383,000 men were employed in 7,033 bituminous coal mines. An index of the economic status of the bituminous coal miner may be obtained from a consideration of a few basic figures. In 1945, the average hourly earnings were \$1.24 but there has always been great variation in the number of hours worked each year in the same mine and among the various mines. The report gives the estimated average annual earning of bituminous coal miners for the year 1945 as \$2,650.

The field work of the study was done by five field teams, each composed of a medical officer, an engineering officer, and a welfare and recreation officer, together with a chief yeoman as clerk. The selection of the mines to be studied was based on a population basis with a random selection of the mines themselves. "In those districts in which the population of miners was largest, the most mines were selected." As a result, 14 per cent of the mines in government custody (260 mines), employing 22 per cent of the miners (71,850), and yielding 18 per cent of the coal output, were studied. In the opinion of the reviewer, this sampling procedure was eminently satisfactory and undoubtedly yielded representative findings.

The body of the report is presented in seven sections, namely, housing and sanitary facilities, public health, industrial medicine, general medical services, hospitalization, hospital facilities, and off-

the-job living. Each of these is in turn broken down into a number of sub-headings in which the material is presented in a summary fashion which is unusually succinct but, nevertheless, so well substantiated factually as to be very convincing. For example, the section on housing presents a discussion of sites, roads, architecture, bathrooms, age of houses, occupancy, maintenance, screening, housekeeping, fire protection, heat and light, leases and sales, bachelor quarters, water supplies, sewage disposal, garbage collection and disposal, and wash houses.

It is quite impossible, in the space of a brief review, to present a detailed discussion of the findings of this large report. Suffice it to say that in general the provisions and facilities were disclosed to range in quality from very bad to good. To cite a simple example, bathrooms were observed in only 10 per cent of company owned houses, while of privately owned houses 31 per cent had bathrooms with tubs or showers or both. Some 11.6 per cent of company owned houses were provided with sewage systems and septic tanks, while 41.7 per cent of privately owned houses were so provided.

It is quite apparent that the coal worker does not share the degree of benefits which one finds other workers of approximately the same economic status enjoying. The report concludes with six pages of recommendations which point up to the important future steps which must be taken to bring the coal mining industry and the workers in the industry to what might be considered the general level surrounding the workers of similar economic status of other industries in the country. The report closes with a supplement, *The Coal Miner and his Family*. This presents a very interesting picture of the life and surroundings of the coal miner, separate from his occupation. The topography and make-up of the report is excellent

and throughout one finds photographs which are at the same time interesting and informative and fine examples of the photographer's art.

The Coal Mines Administrator and the Director of the Medical Survey Group are to be congratulated on the production of a most interesting and valuable public health document.

LEONARD GREENBURG.

*Babies Don't Bounce—By Bil Sullivan. New York: McGraw Hill, 1947. 48 pp. Price, \$1.50.*

The author of this book of amusing and instructive cartoons in eye catching blue and pink, presents his points with the realism of actual experience. He is the father of Kathy, 4½, and Bil, Jr., 6 months.

Part One deals with Baby vs the Home, and Part Two is entitled, Baby Goes Out.

In forty-one lively sketches as many common hazards are pointed out. As the foreword says: "Keeping an eye on Baby is a twenty-four hour job but it's worth it! Wee One reacts automatically to noise, motion and various original ideas of his own, though not always in the best interests of safe living. Our purpose is to give mother (and Dad too) pointers on how to anticipate the entanglements her offsprings may get into in the course of everyday living."

The public health nurse and pediatrician may find this little text a useful tool in safety education.

E. M. HENDRIKSEN

*The Future of Housing — By Charles Abrams. New York: Harper, 1946. 428 pp. Price \$5.00.*

The United States has no housing policy or program. Instead we have a serious nation-wide problem and no immediate prospects for its solution. Until more voters know more about the morass of housing, there is unlikely to be legislative enthusiasm to tangle with the

basic issues involved in providing decent shelter for all Americans.

Mr. Abrams's latest book would be interesting even if it was not important. Seldom does an author treat so effectively such fundamental issues as are set forth and discussed in this volume. In each of 5 parts (The Problem, The Real Estate and Construction Enterprises, The Era of Enlightenment, The Housing Agencies, and Toward Solution), the facts are presented clearly, discussed intelligently, and utilized constructively. *The Future of Housing* is likely to evoke indignant bleats from the vested interests in real estate and building construction, if any of them perchance should read it.

Public health personnel who study this volume may be startled and in all likelihood will be stimulated to further their knowledge of and interests in housing. For the health administrator, the chapters on the housing problem, planning, and the aims of a housing program are particularly pertinent.

M. ALLEN POND

**Physical Fitness Workbook—**  
By Thomas Kirk Cureton. (2nd ed.)  
St. Louis: Mosby, 1947. 150 pp. Price, \$2.50.

This workbook, designed for college men, describes the plan used at the

University of Illinois for appraising physical fitness and progress made in improving such fitness. Physical fitness is conceived as including: physique, organic efficiency and motor fitness—a concept associated with physical efficiency in an earlier era. Physique is determined by a series of anthropometric measures—girths, skeleton, fat, vital capacity, and muscle tone. Organic efficiency is determined by tests of respiratory fitness (e.g. breath holding), and cardiovascular efficiency (e.g. Schneider Test and adaptations). Motor fitness is determined through an elaborate battery of physical stunts and exercises designed to “measure” flexibility, balance, agility, endurance, and strength. The soundness of this concept of physical fitness may be questioned since little attention is given to the health examination (required *only* before motor fitness tests are given), and the correction of remediable conditions, or to health practices other than exercise. In other words the conditions which must be present before the physiological benefits of exercise are likely to accrue are not considered in this reference. The workbook has greater value, albeit limited, in the improvement of the physical education program in the college than in contributing to the health program. MABEL E. RUGEN

## BOOKS RECEIVED

*Listing in this column acknowledges the receipt of books and our appreciation to the senders. Space and the interests of readers will permit review of some, but not all, of the books listed.*

THE ADMINISTRATIVE INTERNSHIP IN THE HOSPITAL. A Manual and Guide. By Paul B. Gillen and Charles E. Prall. Chicago: Joint Commission on Education, 1947. 32 pp.

ADVANCES IN PEDIATRICS, Vol. II. Edited by S. Z. Levine, Allan M. Butler, L. Emmett Holt, Jr., and A. Ashley Weech. New York: Interscience, 1947. 409 pp. Price, \$6.75.

ANATOMY AND PHYSIOLOGY FOR STUDENTS OF PHYSIOTHERAPY, OCCUPATIONAL THERAPY

AND GYMNASTICS. By C. F. V. Smout, M.D. and R. J. S. McDowall, M.D., D.Sc. (2nd ed.). Baltimore: Williams & Wilkins, 1947. 470 pp. Price, \$8.00.

ANNALS OF THE NEW YORK ACADEMY OF SCIENCES. Volume XLVII, Art. 6. “Muscular Contraction.” By Alexander Sadow, *et. al.*, New York: Academy of Sciences, 1947. pages 665–930. Price, \$3.00.

THE CAUSATION OF APPENDICITIS. By A.



- Rendle Short, M.D. Baltimore: Williams & Wilkins, 1947. 79 pp. Price, \$2.50.
- CINEPLASTY. By Henry H. Kessler, M.D., Ph.D. Springfield, Ill.: Thomas, 1947. 201 pp. 314 illus. Price, \$6.75.
- CONCISE ANATOMY. By Linden F. Edwards, Ph.D. Philadelphia: Blakiston, 1947. 548 pp. 472 illus. Price, \$5.50.
- CURARE. ITS HISTORY, NATURE, AND CLINICAL USE. By A. R. McIntyre, M.D. Chicago: University of Chicago Press, 1947. 240 pp. Price, \$5.00.
- THE DEVELOPMENT OF MODERN MEDICINE. By Richard Harrison Shryock. New York: Knopf, 1947. 457 pp. Price, \$5.00.
- DISEASES TRANSMITTED FROM ANIMALS TO MAN. By Thomas G. Hull, Ph.D. (3rd ed.) Springfield, Ill.: Thomas, 1947. 571 pp. Price, \$10.50.
- EFFECTS OF SOIL ELEMENTS ON FOOD. A SYMPOSIUM. By T. J. Brooks. Tallahassee: Florida State Department of Agriculture. 175 pp.
- GENETICS, MEDICINE, AND MAN. By H. J. Muller, C. C. Little, and Laurence H. Snyder. Ithaca, N. Y.: Cornell University Press, 1947. 158 pp. Price, \$2.25.
- INDIA AND AMERICA. By Professor B. J. Vaswani. Syracuse, N. Y.: Chaturi B. Vaswani, 1947. 88 pp. Price, \$.50.
- INSECT PESTS. By Wm. Clunie Harvey, M.D., D.P.H., and Harry Hill. (2nd ed.) London: H. K. Lewis & Co. Ltd., 1947. 347 pp. 27 illus. Price 14s net.
- INSIDES OUT. By John Mason Brown. New York: McGraw-Hill, 1947. 202 pp. Price, \$2.00.
- MEDICAL, LEGAL AND SOCIAL APPROACHES TO THE PROBLEMS OF INEBRIETY. Proceedings of a Conference Sponsored Jointly by the Research Council on Problems of Alcohol and the New York Academy of Medicine. New York: Research Council on Problems of Alcohol, 1947. 60 pp. Price, \$.50
- THE MUNICIPAL YEAR BOOK 1947. Edited by Clarence E. Ridley and Orin F. Nolting. Chicago: International City Managers' Association, 1947. 550 pp. Price, \$8.50.
- THE NATIONAL HEALTH SERVICE ACT, 1946. By J. A. Scott, O.B.E., M.D., D.P.H., and H. A. C. Sturgess. London: Eyre & Spottiswoode, 1947. 93 pp. 9s 6d net.
- THE PSYCHOBIOLOGICAL PROGRAM OF THE WAR SHIPPING ADMINISTRATION. Edited by George G. Killinger with a foreword by Captain Edward Macauley, USN (Ret.) and an introductory chapter by Justin K. Fuller, Assistant Surgeon General, USPHS. Stanford University, Calif.: Stanford University Press, 1947. 351 pp.
- THE ROAD TO SCHOOL HEALTH. Guides for Better School Health. Bulletin No. 1. Madison: Wisconsin Cooperative School Health Program, 1947. 20 pp.
- REPORT OF THE MINISTRY OF HEALTH FOR THE YEAR ENDED 31ST MARCH 1946, INCLUDING THE REPORT OF THE CHIEF MEDICAL OFFICER ON THE STATE OF THE PUBLIC HEALTH FOR THE YEAR ENDED 31ST DECEMBER 1945. Presented by the Minister of Health to Parliament by Command of His Majesty, May 1947. London: His Majesty's Stationery Office. 193 pp. Price, 3s 6d. net.
- THE SANITARY INSPECTORS HANDBOOK. By H. H. Clay (6th ed.) London: H. K. Lewis & Co, 1947. 546 pp. 99 illus. Price, 22s net.
- SCHOOL HEALTH AND HEALTH EDUCATION. By C. E. Turner, D.Sc., Dr.P.H., with the editorial assistance of C. Morley Sellery, M.D. St. Louis, Mo.: Mosby, 1947. 457 pp. Price, \$3.50.
- SOCIAL AGENCIES OF THE CITY OF NEW YORK 1946-47. Prepared under the director of the Committee on Information Services of the Welfare Council. New York: Columbia University Press, 1947. 424 pp. Price, \$4.50.
- STATE CENTRAL CASE RECORD SYSTEMS AND LOCAL CASE REGISTERS FOR TUBERCULOSIS. Washington, D. C.: Federal Security Agency, U. S. Public Health Service, Tuberculosis Control Division, 1947. 88 pp.
- UNION HEALTH CENTER TRIENNIAL REPORT. International Ladies Garment Worker's Union 1944-46. New York: 275 Seventh Avenue. 51 pp.
- UNTO THE LEAST OF THESE. SOCIAL SERVICES FOR CHILDREN. By Emma Octavia Lundberg. New York: Appleton-Century, 1947. 424 pp. Price, \$3.75.
- VITAL STATISTICS 1944 (24TH ANNUAL REPORT). CANADA—DOMINION BUREAU OF STATISTICS. Ottawa: Edmond Cloutier—King's Printer and Controller of Stationery, 1946. 765 pp. Price, \$1.00.
- WATER SUPPLY AND SEWERAGE. By Ernest W. Steel (new 2nd ed.). New York: McGraw-Hill. 666 pp. Price, \$6.00.
- THE YALE JOURNAL OF BIOLOGY AND MEDICINE —C.-E. A. Winslow Number, March, 1947. Vol. 19, No. 4. pp. 339-800. New Haven, Conn.
- THE YEARS AFTER 50. By Wingate M. Johnson, M.D. Foreword by Morris Fishbein, M.D. New York: McGraw-Hill, 1947. 153 pp. Price, \$2.00.

Preliminary Program of the Scientific Sessions of the  
75th Annual Meeting of the American Public Health  
Association and Meetings of Related Organizations  
Atlantic City, N. J., October 6-10, 1947

THE Annual Meeting Program Committee offers a preview of the content of scientific sessions planned in connection with the 75th Annual Meeting in Atlantic City, N.J. The professional affiliations and addresses of speakers are not given, but a complete index to participants will be published in the final program which will be distributed to all delegates at the Registration Desk, Convention Hall. Registration headquarters will be opened at noon on Monday, October 6.

AMERICAN PUBLIC HEALTH ASSOCIATION  
GOVERNING COUNCIL

*Monday, 9:30 A.M. First Meeting—Room B, Convention Hall*

MERIT SYSTEM UNIT

*Monday, 12:30 P.M. Luncheon Session—Room 125, Hotel Ambassador*

EVALUATING MERIT SYSTEM PRINCIPLES ON PUBLIC HEALTH

MONDAY, 2:30 P.M.

FOOD AND NUTRITION AND LABORATORY SECTIONS

*Joint Session—Room C, Convention Hall*

*Presiding:* CHARLES G. KING, Ph. D., and SARA E. BRANHAM, M.D.

The Laboratory Diagnosis of Staphylococcus Food Poisoning.  
GAIL M. DACK, M.D.

The Training of Food Handlers in Institutions. FERDINAND A. KORFF.

Susceptibility to Typhus of Rats on Deficient Diets. FLORENCE K. FITZPATRICK.

Microbiology of Frozen Foods. BERNARD E. PROCTOR, Ph.D.

Studies Showing the Effect of Changes in the New (9th) Edition of Standard Methods in Relation to the Bacteriological Analysis of Milk.  
ROBERT C. THOMAS, BENJAMIN S. LEVINE, Ph.D., and LUTHER A. BLACK, Ph.D.

Committee Reports:

Standard Methods Committee on Examination of Milk and Milk Products. *Chairman,* A. H. ROBERTSON, Ph.D.

Joint Standard Methods Committee on Frozen Desserts and Ingredients. A. H. ROBERTSON, Ph.D.

Joint Committee on Analyzing Frozen Desserts. *Chairman,* FREDERICK W. FABIAN, Ph.D.

MONDAY, 2:30 P.M.

ENGINEERING SECTION AND CONFERENCE OF  
MUNICIPAL PUBLIC HEALTH ENGINEERS

*Joint Session—Room A, Convention Hall.*

*Presiding:* W. SCOTT JOHNSON and HENRY D. PETERS.

Report of Engineering Section Committee on Municipal Public Health Engineering. *Chairman,* JAMES L. BARRON, C.E.

Report of Engineering Section Committee on Water Supply. *Chairman,* CHARLES R. COX.

Public Health Aspects and Administrative Supervision of the Introduction of Chemicals Into Water for Controlling Corrosion and Scaling of Plumbing Systems.

*Panel Leader:* SOL PINCUS, C.E.

*Participants:*

CHARLES R. COX.  
JOEL I. CONNOLLY.  
EDWARD S. HOPKINS.  
HARRY E. JORDAN.

Hydrological and Bacteriological Studies of Fort Loudown Reservoir Swimming Area. ROBERT N. CLARK.

Environmental Health Problems Created in Connection with Decentralization Trend as Observed in Flint, Mich. LEONARD BOARD and HERBERT J. DUNSMORE.

Report of Engineering Section Committee on Sewage Disposal. *Chairman,* LANGDON PEARSE.

Activities of the Merit System Unit of the A.P.H.A. in the Field of Environmental Sanitation. JAMES L. BARRON, C.E.

EPIDEMIOLOGY

*First Session—Room B, Convention Hall*

*Presiding:* JAMES E. PERKINS, M.D. *Chairman.*

Eradication of Tuberculosis by Epidemiological Methods. J. A. MYERS, M.D.

Studies of Pulmonary Calcification. B. J. OLSON, M.D., C. W. EMMONS, LEON FLANCHER, M.D., and JOSEPH A. BELL, M.D.

Epidemiology of Histoplasmin Sensitivity. IVAN BUNNELL, M.D., M. L. FURCULOW, M.D., and CARROLL E. PALMER, M.D.

The Significance of Rare Bacilli in Sputum from the Standpoint of Public Health. F. M. POTTENGER, M.D.

Summary of State Tuberculosis Control Activities. FRANCIS J. WEBER, M.D., and ROBERT J. ANDERSON, M.D.

## MONDAY, 2:30 P.M.

HEALTH OFFICERS, PUBLIC HEALTH NURSING, AND  
PUBLIC HEALTH EDUCATION SECTIONS, AND  
PUBLIC HEALTH VETERINARIANS*Joint Session—Ballroom, Convention Hall**Presiding:* RICHARD F. BOYD, M.D., MARY C. CONNOR, R.N., MABEL E. RUGEN, Ph.D., and JAMES H. STEELE, D.V.M.

The Public Health Nurse's Contribution in the Annual Planning of a Public Health Program. MARION W. SHEAHAN, R.N.

The Place of Public Health Education in a Public Health Program. MAYHEW DERRYBERRY, Ph.D.

The Relation of Animal and Food Sanitation to the Public Health of the Community. JAMES H. STEELE, D.V.M., and MARTIN BAUM, D.V.M.

(Title to be announced). WILLIAM H. CARY, JR., C.E.

The Coördination and Integration of the Public Health Program. HENRY F. VAUGHAN, Dr.P.H.

General Discussion.

## MATERNAL AND CHILD HEALTH

*First Session—Room D, Convention Hall**Presiding:* VIKTOR O. WILSON, M.D., *Chairman.*

Description of the "Rooming-In" Program for the Care of New-born Infants at the New Haven Hospital. EDITH B. JACKSON.

Observation on Unapproved Behavior in Year Old Infants. C. ANDERSON ALDRICH.

Free Choice in Preschool Feeding in the Home. MARGARET F. GUTELIUS, M.D.

The Beginnings of a Preventive Mental Health Program in the State and Local Health Departments. KENT A. ZIMMERMAN, M.D.

Health Services Furnished to Children by Official and Voluntary Health Agencies in Selected States. CHARLES L. WILLIAMS, M.D., KATHERINE BAIN, M.D., and JOHN P. HUBBARD, M.D.

## SCHOOL HEALTH

*First Session—Room 20, Convention Hall**Presiding:* GEORGE M. WHEATLEY, M.D., *Chairman.**Election of Officers.*

Anemia in School Children. WALTER WILKINS, M.D.

The Place of Fluorine in the Dental Health Program for Children. JOHN W. KNUTSON, D.D.S.

A Study of Vision-Testing Procedures. THOMAS E. SHAFFER, M.D.

A Study of Absenteeism in Canadian Schools. A. J. PHILLIPS, Ph.D.

## MONDAY, 2:30 P.M.

## VITAL STATISTICS

*First Session—Room 21, Convention Hall*

*Presiding: RUTH R. PUFFER, Dr.P.H., Chairman.*

*Section Business.*

## NATIONAL AND INTERNATIONAL VITAL STATISTICS

Activities of State and Federal Agencies. ALBERT E. BAILEY, Ph.D.

Medical Attendance During Terminal Illness. MARTA FRAENKEL, M.D.

United Nations Statistical Organization. FORREST E. LINDER, Ph.D.

International Statistical Congress. DARIO CURIEL, M.D.

## MERIT SYSTEM UNIT

*Room 1, Convention Hall*

*Presiding: LILLIAN D. LONG, Ph.D.*

CAN PROFESSIONAL PUBLIC HEALTH PERSONNEL BE SELECTED BY WRITTEN  
EXAMINATION? AN EXCHANGE OF EXPERIENCES

Program to be announced.

## MONDAY, 5:00 P.M.

RECEPTION TO THE PRESIDENT OF THE  
AMERICAN PUBLIC HEALTH ASSOCIATION

*Renaissance Room, Hotel Ambassador, 5-7 P.M., Informal*

## MONDAY, 6:30 P.M.

ENGINEERING SECTION, CONFERENCE OF MUNICIPAL  
PUBLIC HEALTH ENGINEERS, AND CONFERENCE  
OF STATE SANITARY ENGINEERS

*Annual Engineers' Stag Dinner, Venetian Room, Hotel Ambassador.*

*"Bill" Orchard, Master of Ceremonies*

## PUBLIC HEALTH EDUCATION

*Dinner Session—Room 125, Hotel Ambassador*

*Presiding: MABEL E. RUGEN, Ph.D., Chairman.*

*Section Business.*

## TUESDAY, 8:30 A.M.

NATIONAL ADVISORY COUNCIL OF THE  
CLEVELAND HEALTH MUSEUM*Breakfast Session—Rooms 110-111, Hotel Ambassador*

## TUESDAY, 9:30 A.M.

## DENTAL HEALTH

*First Session—Room A, Convention Hall**Presiding:* RICHARD C. LEONARD, D.D.S.

Studies of Fluoride Removal From Drinking Water. F. J. MAIER, D.D.S.

Topical Application of Fluorine Solution to Teeth. J. F. VOLKER, D.D.S.

Lactic Acid Bacillus Counts and Their Relationship to Dental Caries.  
FRANCIS A. ARNOLD, JR., D.D.S.The Relationship of Tryptophane to the Incidence of Caries. NAOMI  
C. TURNER.

Studies of Vitamin K and Dental Caries. L. S. FOSDICK, Ph.D.

## ENGINEERING AND INDUSTRIAL HYGIENE SECTIONS

*Joint Session—Room D, Convention Hall**Presiding:* W. SCOTT JOHNSON and HELMUTH H. SCHRENK, Ph.D.

## AIR HYGIENE

Report of Engineering Section Committee on Air Pollution.  
*Chairman,* H. A. WHITTAKER.Effectiveness of Germicidal Radiant Energy on Air-Borne Respiratory  
Microorganisms. MATTHEW LUCKILSH, M.D., A. H. TAYLOR, and THOMAS  
KNOWLES.The Effect of Ultra-violet Irradiation of the Air on Air Bacteria.  
WILLIAM F. WELLS.Essentials for the Control of Ragweed. ALFRED H. FLETCHER and ISRAEL  
WEINSTEIN, M.D.*Engineering Section Business Session.*

## FOOD AND NUTRITION

*First Session—Room 21, Convention Hall**Presiding:* MARJORIE M. HESELTINE, *Vice-Chairman.**Section Business.*

INTERNATIONAL FOOD AND NUTRITION SITUATION

(Speakers to be announced).

TUESDAY, 9:30 A.M.

## HEALTH OFFICERS

*First Session—Room C, Convention Hall**Presiding:* RICHARD F. BOYD, M.D., *Chairman.*

ESSENTIALS OF GOOD LOCAL PUBLIC HEALTH ADMINISTRATION

*Panel Leader:* V. A. VAN VOLKENBURGH, M.D.*Participants:*

EARLE G. BROWN, M.D.  
CARL E. BUCK, DR.P.H.  
HARRY L. CHANT, M.D.  
L. M. GRAVES, M.D.  
F. M. HALL, M.D.  
MARTIN MILLS, M.D.  
D. A. REEKIE, M.D.  
A. M. SHELAMER, M.D.  
CARL A. WILZBACH, M.D.

## LABORATORY

*First Session—Room 20, Convention Hall**Presiding:* SARA E. BRANHAM, M.D., *Chairman.**Section Business.**Committee Reports:*

Coördinating Committee on Standard Methods. *Chairman,* FRIEND  
LEE MICKLE, Sc.D.

Standard Methods Committee on Diagnostic Procedures and Re-  
agents. *Chairman,* RALPH S. MUCKENFUSS, M.D.

Standard Methods Committee on Diagnostic Procedures in Virus  
and Rickettsial Diseases. *Chairman,* THOMAS FRANCIS, JR., M.D.

Standard Methods Committee on Biology of the Laboratory Animal.  
*Acting Chairman,* PAUL A. MOODY, Ph.D.

Standard Methods Committee on Biological Products. *Acting Chair-  
man,* HAROLD W. LYALL, Ph.D.

Committee for the Examination of Germicides and Antibacterial  
Agents. *Chairman,* STUART MUDD, M.D.

Committee on Salaries. *Chairman,* THOMAS F. SELLERS, M.D.

Report of the Laboratory Section Representative on the Commission  
for the Study of Biological Stains. EDMUND K. KLINE, DR.P.H.

Report of the Laboratory Section Archivist. ANNA M. SEXTON.

The Preparation of Rapid Antigens for the Diagnosis of Typhoid and  
Paratyphoid Fevers. BEN E. DIAMOND.

Comparative Efficiency of Rectal Swabs and Fecal Specimen in De-  
tecting Typhoid and Salmonella Cases and Carriers. HOWARD J.  
SHAUGHNESSY, Ph.D., FRANCES FRIEWER, and ADELE SNYDER.

TUESDAY, 9:30 A.M.

LABORATORY (Cont.)

Quick Micro-Techniques for Bacteriological Work. R. H. WEAVER, Ph.D.

Laboratory Diagnosis of Diphtheria in Two to Eight Hours; A Time-Honored but Much Neglected Method. JOAN B. DANIELS and MARY P. JOHNSON.

Isolation of Psittacosis-like Viruses from Pigeons. JOSEPH ZICHIS, Ph.D., HOWARD J. SHAUGHNESSY, Ph.D., and CATHERINE LEMKE.

MATERNAL AND CHILD HEALTH, EPIDEMIOLOGY,  
SCHOOL HEALTH, AND VITAL STATISTICS  
SECTIONS, AND THE COUNCIL ON  
RHEUMATIC FEVER OF THE  
AMERICAN HEART  
ASSOCIATION

*Joint Session—Ballroom, Convention Hall*

*Presiding:* VIKTOR O. WILSON, M.D., JAMES E. PERKINS, M.D., GEORGE M. WHEATLEY, M.D., RUTH R. PUTTER, Dr.P.H., and DAVID D. RUTSTEIN, M.D.

THE RHEUMATIC FEVER COMMUNITY PROGRAM—  
ITS VALUE IN THE EPIDEMIOLOGICAL STUDY OF RHEUMATIC FEVER

Diagnostic Facilities. CHARLES A. R. CONNOR, M.D.

Nursing Follow-up. MARY PARKER, R.N.

Medical Social Follow-up. FLORENCE MOSHER.

School Health Service. GEORGE M. WHEATLEY, M.D.

Principles of the Epidemiology of Chronic Disease. ALEXANDER D. LANGMUIR, M.D.

*Panel Leader:*

DAVID D. RUTSTEIN, M.D.

*Participants:*

JEAN DOWNES.

THOMAS D. DUBLIN, M.D.

SAMUEL WISHIK, M.D.

PUBLIC HEALTH EDUCATION

*First Session—Rooms 1, 2, 3, 4, 5, 6, 10, Convention Hall*

*Meetings of All Cross-Section Committees.*

Committee on Community Organization for Health Education.  
*Chairman,* CLAIR E. TURNER, Dr.P.H. *Room 1.*

Committee on Convention Public Health Education Practices.  
*Room 2.*

Materials and Publicity. *Chairman,* RAE K. SHOELMAKER.

Motion Picture Theatre. *Chairman,* THOMAS C. STOWELL.



TUESDAY, 9:30 A.M.

## PUBLIC HEALTH EDUCATION (Cont.)

Press Relations. *Chairman, ANNA B. TOWSE.*

Scientific Exhibits. *Chairman, MARIE HARRINGTON.*

Committee on Coördination of Public Health Education Section with all Other Sections of the A.P.H.A. *Chairman, MURIEL F. BLISS, Ph.D. Room 3.*

Committee on Post-War Planning in Public Health Education. *Chairman, MAYHEW DERRYBERRY, Ph.D. Room 4.*

Committee on Public Health Films. *Chairman, KENNETH D. WID-  
DEMER, Room 5.*

Committee on Regionalism-Liaison with Social Science. *Chairman, LUCY S. MORGAN, Ph.D. Room 6.*

Committee on Utilization of Commercial Advertising for Health. *Chairman, EDNA M. KECH, Room 10.*

## PUBLIC HEALTH NURSING

*First Session—Room B, Convention Hall*

*Presiding: MARY C. CONNOR, R.N., Chairman.*

The Public Health Nurse in a Nutritional Appraisal Program. *MARGARET McLAUGHLIN, R.N.*

Public Health Nursing in the Cancer Control Program. *ROSALIE I. PETERSON, R.N.*

Field Experience Facilities in Public Health Nursing. *HELEN FISK, R.N.*

TUESDAY, 12:30 P.M.

## PUBLIC HEALTH NURSING

*Luncheon Session—Venetian Room, Hotel Ambassador*

*Presiding: MARY C. CONNOR, R.N., Chairman.*

*Section Business.*

*Reports by the Chairmen of the Standing Committees:*

*On Administration. MARION W. SHEAHAN, R.N.*

*On Education. ELLA McNEIL, R.N.*

*On Eligibility. ALBERTA WILSON, R.N.*

*Report on the Merit System Examination Program for Public Health Nursing. DOROTHY DEMING, R.N.*

*Report on Joint Scholarship Awards. JESSIE STEVENSON, R.N.*

*Entertainment furnished by the State Organization for Public Health Nursing of New Jersey.*

TUESDAY, 2:30 P.M.

## FIRST SPECIAL SESSION

*Ballroom, Convention Hall**Presiding:* HARRY S. MUSTARD, M.D.

THE HERITAGE OF THE PAST—THE SEED OF THE FUTURE

YESTERDAY

Developments in the Field of Professional Education. WILLIAM P. SHEPARD, M.D.

Progress in the Area of Administration. HUGH R. LEAVELL, M.D.

The Development of Public Support. HOMER FOLKS.

Changing Problems Growing out of the Change in Composition of the Population. LOWELL J. REED, Ph.D.

## LABORATORY AND ENGINEERING SECTIONS

*Joint Session—Room C, Convention Hall**Presiding:* SARA E. BRANHAM, M.D., and W. SCOTT JOHNSON.Report of the Standard Methods Committee on Examination of Water and Sewage. *Chairman,* WALTER L. MALLMANN, Ph.D.Report of the Committee on Shellfish Sanitation. *Chairman,* MILTON H. BIDWELL.Report of the Standard Methods Committee on Examination of Shellfish. *Chairman,* JAMES GIBBARD.

Shellfish Poisoning. JAMES GIBBARD.

Antibiosis Among Enteric Bacteria and Possible Effect on Coliform Index. PIERRE FREDERICO, Ph.D., and MAX LEVINE, Ph.D.

Report of the Subcommittee on Food Utensil Sanitation, Committee on Research and Standards. *Chairman,* W. D. TIEDEMAN.

Comments on Standardization of Test Methods of Surface Active Agents. HOWARD E. LIND, Ph.D.

Test for Detergents. WILLIAM G. WALTER.

Some Properties of Cationics in Sanitization. G. M. RIDENOUR, Ph.D., and EDWARD H. ARMBRUSTER.

A City Department of Health Program on the Improvement of Mechanical Dishwashing. WALTER L. MALLMANN, Ph.D., LEO ZAIKOWSKI and DAVID KAHLER.

## INDUSTRIAL HYGIENE

*First Session—Room B, Convention Hall**Presiding:* HELMUTH H. SCHRENK, Ph.D., *Chairman.*Interpretation of Permissible Limits. *Address of the Chairman,* HELMUTH H. SCHRENK, Ph.D.

TUESDAY, 2:30 P.M.

INDUSTRIAL HYGIENE (Cont.)

Recruitment and Training of Industrial Hygiene Personnel. LEONARD GREENBURG, M.D.

The Pattern of Industrial Hygiene Administration in the United States. WILLIAM T. INGRAM.

Health Problems Resulting from Newer Technological Developments. EMMETT KELLY, M.D.

*Section Business.*

MERIT SYSTEM UNIT

*Room A, Convention Hall*

*Presiding:* REGINALD M. ATWATER, M.D.

PUBLIC PERSONNEL MANAGEMENT

Does Public Health Require Good Personnel Administration?  
(Speaker to be announced).

Public Health Under a Merit System—With Special Reference to the Selection of Professional Workers.

*Panel Discussion.*

Panel Leader and Participants to be announced.

TUESDAY, 8:00 P.M.

FIRST GENERAL SESSION

*Ballroom, Convention Hall*

*Presiding:* HARRY S. MUSTARD, M.D., *President, American Public Health Association.*

*Festival Musical Program.*

*Address of Welcome:* SAMUEL L. SALASIN, M.D.

Greetings from the American Medical Association. GEORGE F. LULL, M.D.

The Place of Nutrition in a Public Health Program. SIR WILSON JAMESON.

Presidential Address. HARRY S. MUSTARD, M.D.

*Presentation of Sedgwick Memorial Medal Award.*

WEDNESDAY, 8:30 A.M.

UNIVERSITY OF MINNESOTA

*Breakfast Session—Venetian Room, Hotel Ambassador.*

## WEDNESDAY, 9:30 A.M.

## DENTAL HEALTH

*Second Session—Room 21, Convention Hall**Presiding:* WALTER J. PELTON, D.D.S., *Chairman.*

Use of Title V Funds for Dental Health. J. THOMAS FULTON, D.D.S.

Observation of Dental Program in Sweden. FRANCIS A. STOLL.

Dentistry in the United Nations Program in Europe. GEORGE A. NEVITT, D.D.S.

A New Community Approach in Conducting Dental Programs. PAUL COOK.

*Section Business.*

## ENGINEERING

*First Session—Room 20, Convention Hall**Presiding:* W. SCOTT JOHNSON, *Chairman.*

## RESEARCH IN SANITATION

Report of Engineering Section Committee on Exploration of Research Needs. *Chairman,* BLUCHER A. POOLE.*Panel Discussion on Sanitation Research.**Panel Leader:* BLUCHER A. POOLE.*Participants:*

JOHN ANDREWS.

ROBERT W. BABIONE, CAPT., U.S.N.

JAMES B. BATY, Major, U.S.A.

J. R. SANBORN, Ph.D.

WALTER F. SNYDER.

ABEL WOLMAN, Dr. Eng.

## SANITARY PROBLEMS IN TRANSPORTATION

Interstate Carrier Sanitation. H. N. OLD.

Human Waste Disposal from Railroad Passenger Cars. ABEL WOLMAN, Dr. Eng., and LLOYD K. CLARK.

Sanitation Factors in Air Transport. ROSS A. MCFARLAND, Ph.D.

## EPIDEMIOLOGY

*Second Session—Room D, Convention Hall*

Salmonella from Dogs and the Possible Relationship to Salmonellosis in Man. ARTHUR H. WOLFF, D.V.M., NORMAN D. HENDERSON, and GRACE L. MCCALLUM.

Dog, Fox, and Cattle Rabies in New York State. Evaluation of Control Procedures. ROBERT F. KORN, M.D., and ALEXANDER ZFISSE, D.V.M.

Elephant Tusks: A Source of Human Anthrax. ROY M. SEIDMAN, M.D., and KENNETH M. WHEELER, Ph.D.

WEDNESDAY, 9:30 A.M.

## EPIDEMIOLOGY (Cont.)

A State-wide Survey of Typhus Fever in Florida. ELSMERE R. RICKARD, M.D., and E. G. RILEY, M.D.

Epidemiology and Control of Murine Typhus in a Southern State. ARCHIE L. GRAY, M.D., and EMIL KOTCHER, Sc.D.

An Outbreak of Smallpox in New York City. ISRAEL WEINSTEIN, M.D.

## HEALTH OFFICERS

*Second Session—Room B, Convention Hall*

Public Health in Britain—The Changing Scene. SIR ANDREW DAVIDSON, M.D.

The Health Officer in Post-War Britain. SIR ALLEN DALEY, M.D.

Post-War Public Health Problems in a Large American City. BRUCE H. DOUGLAS, M.D.

Can Public Health Agencies Handle Poliomyelitis Alone? HART E. VAN RIPER, M.D.

How Much Control of Cancer? EARLE G. BROWN, M.D., and JOSEPH H. KINNAMAN, M.D.

## INDUSTRIAL HYGIENE

*Second Session—Room 21, Convention Hall*

Medical and Nursing Problems for Small Plants. HAROLD P. LYON, M.D.

Medical Care Plans for Industrial Workers in Relation to Public Health Programs. LEE JANIS, M.D., and MILTON I. ROEMER, M.D.

Industrial Sanitation. RICHARD T. PAGE.

*Progress Reports of Section Committees.*

*Section Business.*

SCHOOL HEALTH, MATERNAL AND CHILD HEALTH,  
PUBLIC HEALTH EDUCATION, PUBLIC HEALTH  
NURSING, AND FOOD AND NUTRITION SECTIONS

*Joint Session—Ballroom, Convention Hall*

*Presiding:* GEORGE M. WHEATLEY, M.D., VIKTOR O. WILSON, M.D., MABEL E. RUGEN, Ph.D., MARY C. CONNOR, R.N., and CHARLES G. KING, Ph.D.

SYMPOSIUM ON THE PRE-SERVICE AND IN-SERVICE PREPARATION IN HEALTH OF SCHOOL PERSONNEL

The Role of the Board of Education and the Department of Health in the In-service Preparation of Classroom Teachers, School Administrators, School Nurses, and School Physicians. L. E. BURNETT, M.D., and BEN H. WATT, Ph.D.

WEDNESDAY, 9:30 A.M.

SCHOOL HEALTH, MATERNAL AND CHILD HEALTH,  
PUBLIC HEALTH EDUCATION, PUBLIC HEALTH NURS-  
ING, AND FOOD AND NUTRITION SECTIONS (Cont.)

The Pre-service Preparation of Teachers and School Administrators.  
DOROTHY B. NYSWANDER, Ph.D., BERNICE MOSS, Ed.D., and ELIZABETH  
KELLEY, Ed.D.

The Contribution of the Medical School and the School of Public  
Health. IRA V. HISCOCK, Sc.D.

The Contribution of the School of Nursing and the Graduate Course  
of Public Health Nursing. RUTH FREEMAN, R.N.

*Summary Roundtable with Participants from Sponsoring Sections.*

*Discussion Leader:* WILLIAM P. SHEPARD, M.D.

*Discussants:*

School Health Section—RUTH E. GROUT, Ph.D.

Maternal and Child Health Section—SAMUEL R. BERENBERG, M.D.

Public Health Education Section—BESS EXTON.

Public Health Nursing—HORTENSE HILBERT, R.N.

Food and Nutrition Section—BERTLYN BOSLEY, Ph.D.

VITAL STATISTICS AND LABORATORY SECTIONS,  
AND THE BIOMETRICS SECTION OF THE  
AMERICAN STATISTICAL ASSOCIATION

*Joint Session—Room C, Convention Hall*

*Presiding:* RUTH R. PUFFER, Dr.P.H., and SARA E. BRANHAM, M.D.

APPLICATION OF STATISTICAL METHODS TO LABORATORY DATA

On Development of Harmony Between Scientific Purpose and the  
Foundations of Statistical Method. WILLIAM R. THOMPSON, Ph.D.

An Analysis of the Wilson-Worcester Method for Determining the  
Median Effective Dose of Hemophilus Pertussis Vaccine. MARGARET  
PITTMAN, Ph.D., and JACOB E. LIEBERMAN.

*Discussion:* EDWARD WEISS.

Relative Errors of Bacteriological Plate Counting Methods. THOMAS L.  
SNYDER, Ph.D.

Quantitative Vitamin Assay. CHESTER I. BLISS, Ph.D.

## WEDNESDAY, 12:30 P.M.

## LABORATORY

*Luncheon Session—Room 125, Hotel Ambassador*

*Presiding: SARA E. BRANHAM, M.D., Chairman.*

*Section Business.*

*Report on the Fourth International Microbiological Congress.  
STUART MUDD, M.D.*

## HARVARD PUBLIC HEALTH ALUMNI ASSOCIATION

*Luncheon Session—Venetian Room, Hotel Ambassador*

## ORDER OF THE BOARS

*Luncheon Session—Rooms 121-122, Hotel Ambassador*

## WEDNESDAY, 2:30 P.M.

## GOVERNING COUNCIL

*Second Meeting, Room B, Convention Hall*

## WEDNESDAY, 5:00 P.M.

PUBLIC HEALTH ADVISORY COMMITTEE OF THE  
NATIONAL SANITATION FOUNDATION

*5:00 P.M., and Dinner Session—Rooms 110-111, Hotel Ambassador*

## PUBLIC HEALTH VETERINARIANS

*5:00 P.M., and Dinner Session—Room D, Hotel Chelsea*

EXECUTIVE COMMITTEE, SCHOOL HEALTH NURSING  
SECTION OF THE NATIONAL ORGANIZATION FOR  
PUBLIC HEALTH NURSING

*5:00 P.M., Evening Session—Room 103, Hotel Ambassador*

## WEDNESDAY, 6:30 P.M.

CONFERENCE OF STATE DIRECTORS OF  
HEALTH EDUCATION

*Dinner and Evening Sessions—Rooms 104-105, Hotel Ambassador*

**WEDNESDAY, 6:30 P.M.****CONFERENCE OF PROFESSORS OF  
PREVENTIVE MEDICINE***Dinner and Evening Sessions—Room C, Hotel Chelsea***NATIONAL COMMITTEE OF HEALTH  
COUNCIL EXECUTIVES***Dinner and Evening Sessions—Room 125, Hotel Ambassador***NEW JERSEY HEALTH AND SANITARY ASSOCIATION***Dinner and Evening Sessions—Renaissance Room, Hotel Ambassador***PUBLIC HEALTH CANCER ASSOCIATION***Dinner and Evening Sessions—Como Hall, Hotel Chelsea***WEDNESDAY, 8:30 P.M.****ENGINEERING SECTION COUNCIL AND POLICY  
ADVISORY COMMITTEE***Evening Session—Room 106, Hotel Ambassador***ASSOCIATION OF MATERNAL AND CHILD HEALTH AND  
CRIPPLED CHILDREN'S DIRECTORS***Evening Session—Room 120, Hotel Ambassador***ASSOCIATION OF RESERVE OFFICERS OF THE  
U. S. PUBLIC HEALTH SERVICE***Evening Session—Surf Room, Hotel Ambassador***ASSOCIATION OF STATE AND TERRITORIAL  
HEALTH OFFICERS***Evening Session—Rooms 121-122, Hotel Ambassador***PUBLIC HEALTH METHODS STUDY SECTION OF THE  
U. S. PUBLIC HEALTH SERVICE***Evening Session—Room 107, Hotel Ambassador*



WEDNESDAY, 8:30 P.M.

BACTERIOLOGY STUDY SECTION OF THE  
U. S. PUBLIC HEALTH SERVICE

*Evening Session—Room 108, Hotel Ambassador*

COUNCIL OF STATE DIRECTORS OF PUBLIC  
HEALTH NURSING

*Evening Session—Room 102, Hotel Ambassador*

JOINT COMMITTEE ON SCHOOL NURSING OF THE  
NATIONAL ORGANIZATION FOR PUBLIC  
HEALTH NURSING

*Evening Session—Room 109, Hotel Ambassador*

THURSDAY, 8:30 A.M.

UNIVERSITY OF MICHIGAN ALUMNI

*Breakfast Session—Como Hall, Hotel Chelsea*

YALE UNIVERSITY ALUMNI

*Breakfast Session—Room C, Hotel Chelsea*

THURSDAY, 9:30 A.M.

DENTAL HEALTH SECTION AND THE AMERICAN  
SCHOOL HEALTH ASSOCIATION

*Joint Session—Room C, Convention Hall*

*Presiding:* LESTER A. GERLACH, D.D.S., and CYRUS H. MAXWELL, M.D.

Materials and Methods in Dental Health Teaching in Schools.  
MARY BOWEN.

The Educational Approach of the School Dental Hygienist.  
MARGARET JEFFREYS.

The Provision of Dental Care by the School and by the Family Dentist. E. HORACE JONES, D.D.S.

The Part of the State Health Department in the School Dental Program. J. M. WISAN, D.D.S.

Dental Health Education Services of the American Dental Association.  
GLENN G. WALTER.

THURSDAY, 9:30 A.M.

FOOD AND NUTRITION SECTION

*Second Session—Room B, Convention Hall*

METHODS FOR APPRAISAL OF NUTRITIONAL STATUS

Experiences in Appraising Nutritional Status in the U. S. Public Health Service. HAROLD R. SANDSTEAD, M.D.

Microchemical Procedures and Their Use in the Investigation of Problems in Nutrition. ROBERT E. SHANK, M.D.

Appraising the Nutritional Status of Mothers and Infants. CLEMENT SMITH, M.D., and HAROLD STUART, M.D.

Experiences in New York City Nutrition Clinics. NORMAN JOLLIFFE, M.D.

INDUSTRIAL HYGIENE AND ENGINEERING SECTIONS

*Joint Session—Room D, Convention Hall*

*Presiding:* HELMUTH H. SCHRENK, Ph.D., and W. SCOTT JOHNSON.

GENERAL ATMOSPHERIC POLLUTION

*Panel Leader:* (To be announced.)

*Participants:*

JOHN BUXELL.

H. G. DYKTOR.

CHARLES L. SENN.

ARTHUR C. STERN.

EPIDEMIOLOGY, HEALTH OFFICERS, LABORATORY,  
MATERNAL AND CHILD HEALTH, AND  
SCHOOL HEALTH SECTIONS

*Joint Session—Ballroom, Convention Hall*

*Presiding:* JAMES E. PERKINS, M.D., RICHARD F. BOYD, M.D., SARA E. BRANHAM, M.D., VIKTOR O. WILSON, M.D., and GEORGE M. WHEATLEY, M.D.

CURRENT STATUS OF IMMUNIZATION PROCEDURES

Smallpox. RALPH S. MUCKENTUSS, M.D.

Influenza. THOMAS FRANCIS, JR., M.D.

Pertussis. JOSEPH A. BILL, M.D.

Tuberculosis. HERMAN E. HILLEBOE, M.D.

Typhoid Fever. COLONEL RUFUS L. HOLT, M.C.

Diphtheria. DONALD T. FRASER, M.B., D.P.H.

Tetanus and Exotic Diseases of Military Importance. ARTHUR P. LEE, M.D.

Practical Aspects of Immunization Programs. FRANKLIN H. TICE, M.D.

THURSDAY, 9:30 A.M.

## PUBLIC HEALTH EDUCATION

*Second Session—Rooms 1, 2, 3, 4, 5, 6, 10, Convention Hall**Meetings of all Regional Committees.*

PUBLIC HEALTH EDUCATION NEEDS AND PROBLEMS OF THE REGIONS.

Committee on Public Health Education Problems in the Far West Region. *Chairman, HOWARD W. LUNDY, DR.P.H. Room 1.*Committee on Public Health Education Problems in Latin America. *Chairman, PHILIP L. RILEY. Room 2*Committee on Public Health Education Problems in the Middle States Region. *Chairman, HUGH MASTERS. Room 3.*Committee on Public Health Education Problems in the Northeastern Region. *Chairman, HOMER N. CALVER. Room 4.*Committee on Public Health Education Problems in the Northwestern Region. *Chairman, EDNA GERKEN. Room 5.*Committee on Public Health Education Problems in the Southeastern Region. *Chairman, HELEN A. MARTIKAINEN. Room 6.*Committee on Public Health Education Problems in the Southwestern Region. *Chairman, OPAL HARTLINE, Ph.D. Room 10.*

## VITAL STATISTICS

*Second Session—Room A, Convention Hall*

BASIC TRAINING FOR VITAL STATISTICS

*Panel Leader: C.-E. A. WINSLOW, DR.P.H.**Participants:*

The Teacher. MARGARET MERRELL, Sc.D.

The Health Officer. HUNTINGTON WILLIAMS, M.D.

The Public Health Nurse. MARION W. SHEAHAN, R.N.

The Health Educator. LAURENCE T. ROGERS, Ph.D.

The Registrar. ARTHUR W. HEDRICH, Sc.D.

The Statistician. RUTH R. PUFFER, DR.P.H.

*Section Business.*

THURSDAY, 12:30 P.M.

## ENVIRONMENTAL SANITATION INSTRUCTORS

*Luncheon Session—Rooms 110-111, Hotel Ambassador**Open to instructors on faculties giving instruction in environmental sanitation*

## THURSDAY, 2:30 P.M.

## SECOND SPECIAL SESSION

*Ballroom, Convention Hall**Presiding:* HARRY S. MUSTARD, M.D.THE HERITAGE OF THE PAST—THE SEED OF THE FUTURE  
TOMORROW

The Unfinished Job of Essential Public Health Service. HAVEN EMERSON, M.D.

New Problems in the Field of Medical Care. THOMAS PARRAN, M.D.

Social and Economic Factors in Disease. C.-E. A. WINSLOW, DR.PH.

Public Health and the Future. RAYMOND B. FOSDICK, LL.D.

## LABORATORY

*Second Session—Room B, Convention Hall*

SOME PRESENT-DAY ASPECTS OF PUBLIC HEALTH LABORATORY WORK

A Modified Test for Occult Blood Eliminating and False Reactions Due to Iron Salts. NICHOLAS M. MOLNAR.

The Cell Smear Methods of Diagnosing Cancer. GEORGE N. PAPANICOLAOU, M.D.

Is the Rh Factor a Public Health Laboratory Problem? ANNA I. VANSAUN.

Blood Grouping and Rh Typing in a State Public Health Laboratory. ROBERT A. MACCREADY, M.D., and ROBERT T. MCGEE.

The Production of the Rh Typing Serums. LOUIS K. DIAMOND, M.D.

A Report on the Field Use of Chick Membrane Culture Smallpox Vaccine in Texas. E. B. M. COOK, PATTI N. CRAIN, and J. V. IRONS, SC.D.

Heat Resistance Studies with Spores of *Bacillus anthracis* and Related Mesophilic Aerobic Bacilli in Liquid Substrates and in Hair and Bristles. ROY SCHNEITER, PH.D., and ROBERT W. KOLB.

Universal Serologic Reaction in Lepromatous Leprosy. REUBEN I. KAHN, SC.D., BETTY J. BARIBEAU, and FLORA T. VILLALON, M.D.

## THURSDAY, 7:00 P.M.

## SECOND GENERAL SESSION

*Annual Banquet—Wedgewood Room, Hotel Chelsea**Presiding:* HARRY S. MUSTARD, M.D., *President,* American Public Health Association.*Presentation of Forty Year Membership Certificates.**Announcement of New Officers, Resolutions.**Presentation of the Lasker Awards for 1947.**Dancing. Refreshments. Informal.*

FRIDAY, 9:30 A.M.

## ENGINEERING SECTION

*Second Session—Room C, Convention Hall*

Opportunities for the Engineer in Public Health. ROBERT N. CLARK.

Sanitary Engineering in the Design of Hospital Facilities. A. H. WILTEPS.

Public Health and Sanitation Problems Arising in Connection with the Public Housing Program. ARTHUR E. GORMAN.

Graduate Training of Engineers in Public Health. JOHN M. HENDERSON.

Inservice Training for Sanitarians in Local and State Health Departments. JOHN BUXELL.

Two Years of Organized County-wide House-to-House Sanitation and Insect Control with DDT. J. A. WILLMAN.

Program of Training Local Sanitary Field Workers in the Amazon. EMIL T. CHANLETT and EDMUND G. WAGNER.

## Committee Reports:

Committee on Industrial Sanitation. *Chairman*, HERBERT M. BOSCH.

Committee on Rural Sewage Disposal. *Chairman*, WILLIAM T. INGRAM.

Committee on School Sanitation. *Chairman*, HERBERT J. DUNSMORE.

## EPIDEMIOLOGY

*Third Session—Room 20, Convention Hall*

Epidemiology of Colorado Tick Fever. LLOYD FLORIO, M.D.

Comparative Epidemiology of Poliomyelitis in Certain California Cities. W. McDOWELL HAMMON, M.D.

Death Defect and Disability in Prenatal Life: An Epidemiologic Consideration. THEODORE H. INGALLS, M.D., and JOHN E. GORDON, M.D.

Pertussis Immunization with an Alum-Precipitated Mixture of Diphtheria Toxoid and Pertussis Vaccine. JOSEPH A. BELL, M.D.

Reactions Accompanying the Use of Influenza Virus Vaccines. JONAS E. SALK, M.D.

## HEALTH OFFICERS

*Third Session—Room A, Convention Hall*

## HOSPITAL RELATIONS

The Hospital as an Instrument in a Public Health Program. VANE HOGE, M.D.

Hospital Program of New York State. JOHN BOUPKE, M.D.

Hospital Services in Saskatchewan. FREDERICK D. MOTT, M.D.

Hospital Program in Indiana. L. E. BURNEY, M.D.

Hospital and Health Center Program in Latin America. RICHARD J. PLUNKETT, M.D.

FRIDAY, 9:30 A.M.

LABORATORY SECTION AND CONFERENCE OF STATE  
AND PROVINCIAL PUBLIC HEALTH  
LABORATORY DIRECTORS

*Joint Session—Ballroom, Convention Hall*

*Presiding: SARA E. BRANHAM, M.D., and MYRTLE GREENFIELD.*

*Program to be announced.*

PUBLIC HEALTH EDUCATION

*Third Session—Room D, Convention Hall.*

*Presiding: ANN W. HAYNES, Vice-Chairman.*

Canada Sees New Horizons of Health Education. LT. COLONEL C. W. GILCHRIST.

Research and Educational Objectives in Combating Leprosy. COLONEL G. H. RAREY.

Recent Research Studies in Alcoholism. JOSEPH HIRSH.

Volunteers Under Professional Direction for Community Health. RAYMOND G. NEBELUNG, DR.P.H.

SCHOOL HEALTH

*Second Session—Room B, Convention Hall*

COMMUNITY RESOURCES FOR HEALTH EDUCATION—HOW WELL ARE THEY  
BEING UTILIZED IN THE SCHOOL PROGRAM?

*Discussants:*

A School Administrator. RAYMOND L. COLLINS.

A Health Officer. GEORGE JAMES, M.D.

A Voluntary Agency Health Educator. BERYL J. ROBERTS.

A Teacher Educator. W. C. MASON, M.D.

A Classroom Teacher. MABEL STUDEBAKER.

PUBLIC HEALTH VETERINARIANS

*Room 21, Convention Hall*

FRIDAY, 12:30 P.M.

MEETING OF ALL SECTION COUNCILS WITH THE  
EDITORIAL BOARD

*Luncheon Session—Venetian Room, Hotel Ambassador*

CONFERENCE OF STATE AND PROVINCIAL PUBLIC  
HEALTH LABORATORY DIRECTORS

*Luncheon Session—Como Hall, Hotel Chelsea*

FRIDAY, 2:30 P.M.

CONFERENCE OF STATE AND PROVINCIAL PUBLIC  
HEALTH LABORATORY DIRECTORS

*2:30 P.M., Renaissance Room, Hotel Ambassador*

*6:30 P.M., Dinner Session, Venetian Room, Hotel Ambassador*

SATURDAY, 9:30 A.M.

CONFERENCE OF STATE AND PROVINCIAL PUBLIC  
HEALTH LABORATORY DIRECTORS

*Venetian Room, Hotel Ambassador*

## ASSOCIATION NEWS

### SPEAKERS AT WESTERN BRANCH A.P.H.A. ANNUAL MEETING DECORATED BY HAWAIIAN GROUP

At the meeting of the Western Branch American Public Health Association held in San Francisco, Calif., the Hawaiian delegation brought fresh leis by air from Honolulu for the officers and speakers at the Branch meeting. These were presented at the Banquet Session on May 27.



Left to right: Miss Laura A. Draper; Karl F. Meyer, Ph.D., President, Western Branch; Florence Sabin, M.D., President-Elect, Western Branch; Reginald M. Atwater, M.D., Executive Secretary, A.P.H.A.; Thomas Parran, M.D., Surgeon General, U.S.P.H.S.; and V. Mary Crosse, M.D., Senior Medical Officer from Maternal and Child Welfare, Birmingham, England.

### SOUTHERN AND WESTERN BRANCH A.P.H.A. MEETINGS FIXED FOR 1948

The officers of the Southern Branch American Public Health Association of which John M. Whitney, M.D., New Orleans, La., is Secretary-Treasurer, have announced that the 1948 meeting of the Southern Branch will be held in New Orleans beginning April 12 at the Roosevelt Hotel. Particular attention is

called to this date because of the desire to avoid conflicts with other meetings in the territory of the Branch.

The officers of the Western Branch A.P.H.A. of which Walter Mangold of Berkeley, Calif., is Secretary, have announced that the 1948 meeting of the Western Branch will be held in Salt Lake City, Utah, the last week of May. Requests have been received for the organization of a team of speakers to



attend state meetings before and after the dates of the Western Branch.

The Executive Board of the American Public Health Association has expressed itself as eager to serve the Branches and the state public health associations, especially those affiliated with the A.P.H.A., in connection with their annual meetings. It is recognized that much more help can be offered when these meetings are related to the dates of the Branch sessions. The Board has directed that priority should be

given in 1948 to requests which may be received from affiliated societies in the territory of the Southern Branch. In case there should be a desire on the part of these associations to set their dates in a consecutive pattern which would make it possible to utilize a group of speakers selected on a national or perhaps an international basis, the A.P.H.A. office will welcome communications from the officers of Affiliated Societies and other state associations wishing to participate in 1948 plans.

### APPLICANTS FOR FELLOWSHIP

*In accordance with the By-laws of the Association, the names of applicants for Fellowship are officially published herewith. They have requested affiliation with the Sections indicated. Action by the various Section Councils, the Committee on Eligibility, and the Governing Council will take place during the Atlantic City Annual Meeting.*

#### Health Officers Section

- Solomon J. Axelrod, M.D., Senior Surgeon (R); Chief, Health Services Division, Labor Branch, U. S. Dept. of Agriculture, Washington, D. C.
- Asa Barnes, M.D., M.P.H., Pacific Area Medical Director, American Red Cross, San Francisco, Calif.
- Daniel C. Barrett, M.D., M.P.H., Medical Director, Southeastern Branch Office, State Board of Health, Columbus, Ind.
- Major Philip E. M. Bourland, M.C. (M.D., M.S.P.H.), Chief, Preventive Medicine Division, Public Health and Welfare Section, GHQ, SCAP, Tokyo, A.P.O., San Francisco, Calif.
- John M. Chapman, M.D., M.P.H., Assistant Director, Bureau of Medical Services, City Health Dept., Los Angeles, Calif.
- Leland H. Dame, M.D., Director, Orange County Health Dept., Orlando, Fla.
- Erwin C. Drescher, M.D., M.P.H., Commissioned Officer, U. S. Public Health Service, New York, N. Y.
- Harry S. Fein, M.D., M.S.P.H., Postgraduate Student (Conservation of Hearing), Dept. of Otolaryngology, University of Illinois College of Medicine, Chicago, Ill.
- F. Kenneth Gates, M.D., District Health Officer, Los Angeles County Health Dept., Alhambra, Calif.
- Frank M. Hall, M.D., M.P.H., Director, State Board of Health Training Center, Gainesville, Fla.
- M. Flint Haralson, M.D., Medical Director, U. S. Public Health Service, Baltimore, Md.
- Andrew Hedmeg, M.D., M.P.H., Health Officer, Harrison County Health Dept. Gulfport, Miss.
- Gerald A. Heidbreder, M.D., M.P.H., Chief, Division of Venereal Disease Control, Los Angeles County Health Dept., Los Angeles, Calif.
- Chester A. Hicks, M.D., Dr.P.H., Director of Public Health, New Rochelle, N. Y.
- Robert M. Hursh, M.D., Director, Bureau of Health, Harrisburg, Pa.
- Edwin H. Jorris, M.D., M.S.P.H., Assistant State Health Officer, Madison, Wis.
- Richard A. Koch, M.D., M.P.H., Chief, Division of Venereal Disease, City Health Dept., San Francisco, Calif.
- Richard K. C. Lee, M.D., Dr.P.H., Assistant Health Executive, Territorial Board of Health, Honolulu, T. H.
- Fred P. Long, M.D., M.S.P.H., Director, Division of Preventable Disease Control, State Dept. of Health, Lincoln, Neb.
- Fred Mayes, M.D., Assistant State Health Officer and Director of Local Health Administration, State Board of Health, Topeka, Kan.
- Marshall W. Meyer, M.D., M.P.H., Venereal Disease Control Officer, State Board of Health, Madison, Wis.
- Guy R. Post, M.D., M.P.H., Director, Crippled Children's Service, State Dept. of Education, Jackson, Miss.
- Milton I. Roemer, M.D., M.P.H., Associate in Medical Care Administration, States Re-

lations Division, U. S. Public Health Service, Washington, D. C.

Ralph F. Sikes, M.D., M.P.H., Health Officer, Norwalk Conn.

Charles M. Smith, M.D., Member, State Board of Health, and Health Officer, Provo, Utah

Jess B. Spielholz, M.D., M.S.P.H., Head, Cancer Control Section, State Dept. of Health, Seattle, Wash.

George C. Stucky, M.D., Director, Eaton County Health Dept., Charlotte, Mich.

William J. Sullivan, M.D., M.P.H., Acting Assistant Chief, Surgical Division, Veterans' Administration, Washington, D. C.

Vernon A. Turner, M.D., M.P.H., Assistant Director, Bureau of Local Health Services, State Dept. of Health, Abingdon, Va.

William R. Willard, M.D., Dr.P.H., Assistant Professor of Public Health, Yale University Medical School, New Haven, Conn.

Charles L. Williams, Jr., M.D., M.P.H., Surgeon, U. S. Public Health Service, Washington, D. C.

Frank E. Wilson, M.D., M.P.H., Deputy National Medical Director, American National Red Cross, Washington, D. C.

Vernon M. Winkle, M.D., M.P.H., Assistant Director of Local Health Service, State Board of Health, Topeka, Kan.

James E. Wolfe, M.D., Director of Public Health, Wichita, Kan.

Rhea L. Wyatt, M.D., M.P.H., Director, Alcorn County Health Dept., Corinth, Miss.

#### *Laboratory Section*

Howard L. Bodily, Ph.D., Assistant Chief, Division of Laboratories, State Dept. of Public Health, Berkeley, Calif.

Michael A. Farrell, Ph.D., Professor and Head, Dept. of Bacteriology, Pennsylvania State College, State College, Pa.

George E. Foley, Assistant Bacteriologist, Massachusetts General Hospital, Boston, Mass.

Louis P. Gebhardt, M.D., Ph.D., Professor and Acting Head, Dept. of Bacteriology, University of Utah Medical School, Salt Lake City, Utah

Albert V. Hardy, M.D., Dr.P.H., Director of Laboratories, State Board of Health, Jacksonville, Fla.

Joseph Lebowich, M.D., Director, Saratoga County Laboratory, Saratoga Springs, N. Y.

Lt. Col. Arthur P. Long, M.C. (M.D., Dr. P.H.), Infectious Disease Control, Preventive Medicine Division, U. S. Army, Washington, D. C.

Loren D. Moore, M.D., Assistant Director, Division of Biologic Laboratories, State Dept. of Health, Jamaica Plain, Mass.

Elizabeth I. Parsons, Sc.D., Assistant Professor, Dept. of Bacteriology, Johns Hopkins University School of Hygiene and Public Health, Baltimore, Md.

#### *Vital Statistics Section*

Robert D. Grove, Ph.D., Senior Social Science Analyst, National Office of Vital Statistics, Washington, D. C.

Martha C. Jones, B.A., Statistical Field Consultant, National Tuberculosis Association, New York, N. Y.

Herbert H. Marks, A.B., Manager, Insurance Medical Statistics, Metropolitan Life Insurance Co., New York, N. Y.

Elizabeth H. Pitney, Ph.D., Biostatistician, National Office of Vital Statistics, Washington, D. C.

Christopher Tietze, M.D., Statistical Director, Italian Studies, Johns Hopkins University School of Hygiene and Public Health, Baltimore, Md.

Edward S. Weiss, M.S.P.H., Biometrician, Tuberculosis Control Division, U. S. Public Health Service, Washington, D. C.

Theodore D. Woolsey, A.B., Biostatistician, Public Health Methods Division, U. S. Public Health Service, Washington, D. C.

#### *Engineering Section*

Frederick F. Aldridge, S.M., Chief, Sanitary Engineering Branch, UNRRA, Washington, D. C.

Edward S. Hopkins, B.S., Filtration Engineer, Bureau of Water Supply, Baltimore, Md.

Robert S. Ingols, Ph.D., Research Associate Professor, Georgia School of Technology, Atlanta, Ga.

Benn J. Leland, M.S., Chief Sanitary Engineer, Cook County Dept. of Public Health, Chicago, Ill.

George W. Marx, C.E., Director, Division of Sanitary Engineering, State Dept. of Health, Phoenix, Ariz.

Herbert Moore, C.E., M.S., Consulting Engineer, Milwaukee, Wis.

Louis W. Pickles, C.E., M.P.H., Director, Division of Sanitation, St. Louis County Health Dept., Clayton, Mo.

Joseph A. Salvato, Jr., M.C.E., District Sanitary Engineer, State Dept. of Health, Poughkeepsie, N. Y.

Perry C. Sharp, B.S.C.E., Sanitary Engineer, Wyandotte County Health Dept., Kansas City, Kan.

Earle W. Sudderth, B.S., Sanitary Engineer, Dallas County Health Dept., Dallas, Tex.

E. Carl Warkentin, M.S., Sanitary Engineer, State Dept. of Health, Oklahoma City, Okla.

Charles T. Wright, B.S.S.E., Senior Sanitary Engineer, U. S. Public Health Service, Denver, Colo.

#### *Industrial Hygiene Section*

Marcos Charnes, M.D., M.P.H., Member of Section in Charge of Industrial Hygiene, International Labor Office, Montreal, Que., Canada

Richard D. Mudd, M.D., Ph.D., Medical Director, Chevrolet-Grey Iron Foundry, General Motors Corp., Saginaw, Mich.

Robert T. Pring, B.S.Ch.E., Director, Industrial Hygiene Dept., Kennecott Copper Corp., Garfield, Utah

#### *Food and Nutrition Section*

Walter Wilkins, M.D., Ph.D., Director of Nutrition Investigations and Services, State Board of Health, Jacksonville, Fla.

#### *Maternal and Child Health Section*

Katherine Bain, M.D., Director, Division of Research in Child Development, Children's Bureau, Washington, D. C.

Caroline A. Chandler, M.D., Assistant Professor of Preventive Medicine, Johns Hopkins University School of Medicine, Baltimore, Md.

Edward Davens, M.D., Chief, Bureau of Child Hygiene, State Dept. of Health, Baltimore, Md.

Hans Meyer, M.D., Senior Assistant Physician in Charge of Feeble-minded Division, Crownsville State Hospital, Crownsville, Md.

Ruth A. Parmelee, M.D., M.P.H., Medical Adviser, Near East Foundation, Athens, Greece

Dean W. Roberts, M.D., Chief, Bureau of Medical Services, State Dept. of Health, Baltimore, Md.

Edward R. Schlesinger, M.D., M.P.H., Acting Director of Maternal and Child Health, State Dept. of Health, Albany, N. Y.

Stuart S. Stevenson, M.D., M.P.H., Associate in Child Health, Harvard University School of Public Health, Boston, Mass.

#### *Public Health Education Section*

Vivian V. Drenckhahn, M.S., C.P.H., Associate in Health Education, National Tuberculosis Association, New York, N. Y.

Thomas D. Fitzgerald, M.D., M.S.P.H., Professor of Health Education and Director of

Student Health, Illinois State Normal University, Normal, Ill.

Ruth J. Cramer Frantz, R.N., M.P.H., Director of Health Education, Wisconsin Anti-Tuberculosis Association, Milwaukee, Wis.

John L. C. Goffin, M.D., Supervisor of Health Education, Board of Education, Los Angeles, Calif.

Opal C. Hartline, Ph.D., M.P.H., Director of Health Education, City-County Health Unit, El Paso, Tex.

Joseph Hirsh, M.A., Associate Director in Charge of Education, Research Council on Problems of Alcohol, New York, N. Y.

Milton E. Kossack, M.S.P.H., Director of Health Education, City Health Dept., New Orleans, La.

Elna I. Perkins, M.S., Executive Secretary, Greenwich Tuberculosis and Health Association, Greenwich, Conn.

Stella Randolph, M.A., Director of Health Education, Montgomery County Health Dept., Rockville, Md.

Ruth Sumner, Ph.D., M.S.P.H., Director, Division of Health Education and Training Officer in Health Education, Savannah-Chatham County Health Dept., Savannah, Ga.

Theda L. Waterman, B.S., C.P.H., Consultant in Health Education, Tuberculosis Institute of Chicago and Cook County, Chicago, Ill.

Harold M. Williams, M.D., Assistant Secretary-Editor, State Medical Association of Texas, Fort Worth, Tex.

Laura B. Wilson, R.N., Health Counselor, Dormont Board of Education, Pittsburgh, Pa.

#### *Public Health Nursing Section*

Hazel E. Altmann, R.N., B.S.Ed., Supervising Nurse, City Health Dept., Jackson, Mich.

Sybil P. Bellos, R.N., Director, Greenwich Town Nursing Service, Greenwich, Conn.

Irene Carn, R.N., A.M., Associate Chairman, Dept. of Nursing, Skidmore College and New York Post-Graduate Hospital, New York, N. Y.

Clara M. Chitwood, R.N., B.S., District Supervising Nurse, State Dept. of Health, Gouverneur, N. Y.

L. Ann Conley, R.N., M.P.H., Assistant Professor of Nursing, Wayne University, Detroit, Mich.

Wnona E. Darrah, R.N., M.A., Director of Health and Welfare, Monmouth County Organization for Social Service, Red Bank, N. J.

M. Olwen Davies, R.N., M.A., Instructor and Assistant Professor of Nursing, University of California, San Francisco, Calif.

Helen F. Dunn, B.S., Director of Public Health Nursing, State Dept. of Health and Welfare, Augusta, Me.

Esther M. Finley, R.N., M.A., Assistant to Director, Division of Public Health Nursing, State Dept. of Health, Concord, N. H.

Helen L. Fisk, R.N., B.S., Chief, Division of Public Health Nursing, State Dept. of Health, Baltimore, Md.

Roberta E. Foote, R.N., M.A., Director of Public Health Nursing Education, State Board of Health, Topeka, Kan.

Clarissa Gibson, M.A., Director, Visiting Nurse Association of Scranton and Lackawanna County, Scranton, Pa.

Portia Irick, R.N., B.S., Director of Nursing Services, American Red Cross, San Francisco, Calif.

Martha R. Jenny, R.N., M.S., Associate Professor of Public Health Nursing, University of Wisconsin, Madison, Wis.

Lillian J. Johnston, R.N., B.S., Consultant Public Health Nurse, Division of Communicable Diseases, State Dept. of Health, Albany, N. Y.

Mildred C. Lant, M.A., Public Health Nurse, Brooklyn Visiting Nurse Association, Brooklyn, N. Y.

Bessie K. Littman, R.N., M.A., Public Health Nursing Consultant, State Dept. of Public Health, San Francisco, Calif.

Janice E. Mickey, R.N., M.S., Assistant Professor, School of Public Health, University of Minnesota, Minneapolis, Minn.

Mary C. Mulvany, R.N., M.A., Dean, School of Nursing Education, St. John's University, Brooklyn, N. Y.

Mary E. Parker, R.N., M.S.P.H., Assistant Director of Public Health Nursing, State Dept. of Health, Albany, N. Y.

Madeline Roessler, R.N., M.A., Director of Nurses, Cook County Dept. of Public Health, Chicago, Ill.

Mathilda Scheuer, Educational Director, Visiting Nurse Society, Philadelphia, Pa.

Julia D. Smith, R.N., M.A., Director, Instructive Visiting Nurse Association, Richmond, Va.

Janet F. Walker, M.S., Assistant Professor in Nursing Education, Catholic University, Washington, D. C.

Patricia M. Walsh, R.N., M.A., Instructor in Public Health Nursing, School of Public Health, University of Michigan, Ann Arbor, Mich.

Ruth B. Wood, R.N., M.A., Executive Director, Visiting Nurse Association, Newark, N. J.

#### *Epidemiology Section*

Lester Breslow, M.D., M.P.H., Chief, Chronic Disease Service, State Dept. of Public Health, San Francisco, Calif.

Arthur C. Curtis, M.D., M.P.H., Director, Division of Tuberculosis Control, State Health Dept., Little Rock, Ark.

Theodore S. Drachman, M.D., M.S.P.H., Deputy Commissioner, Westchester County Dept. of Health, Peekskill, N. Y.

Arthur B. Robins, M.D., Dr.P.H., Supervisor of Clinics, City Dept. of Health, New York, N. Y.

A. Daniel Rubenstein, M.D., M.P.H., District Health Officer, North Metropolitan District, State Dept. of Health, Brighton, Mass.

Robert L. Simmons, M.D., M.P.H., Associate Professor and Head, Dept. of Preventive Medicine and Public Health, Louisiana State University School of Medicine, New Orleans, La.

Hugh H. Smith, M.D., M.P.H., Assistant Director, International Health Division, Rockefeller Foundation, New York, N. Y.

Capt. Van C. Tipton, M.C. (M.D., M.P.H.), Officer in Charge, Epidemiology Branch, Bureau of Medicine and Surgery, Navy Dept., Washington, D. C.

#### *School Health Section*

William J. Dougherty, M.D., Medical Inspector of Schools and Board of Health Physician, Frackville, Pa.

Dorothy B. Nyswander, Ph.D., Professor of Health Education, School of Public Health, University of California, Berkeley, Calif.

John H. Shaw, Ed.D., Chairman, Division of Teacher Training for Men, Syracuse University, Syracuse, N. Y.

Warren H. Southworth, Dr.P.H., M.A., Associate Professor of Education, University of Wisconsin, Madison, Wis.

#### *Dental Health Section*

Margaret H. Jeffreys, M.P.H., Supervisor of Oral Hygiene and Associate in Health Education, State Dept. of Health, Dover, Del.

William H. Rumbel, D.D.S., Director, Bureau of Dental Hygiene, State Dept. of Health, Charleston, W. Va.

#### *Unaffiliated*

Ludwik Anigstein, M.D., Ph.D., Professor of Preventive Medicine and Public Health and Associate Professor of Tropical Medicine, University of Texas Medical Branch, Galveston, Tex.

Fred C. Bishopp, Ph.D., Assistant Chief in Charge of Research, Bureau of Entomology

and Plant Quarantine, U. S. Dept. of Agriculture, Washington, D. C.

Murray C. Brown, M.D., Director of Medical Education and Professor of Medicine, Meharry Medical College, Nashville, Tenn.

C. Walter Clarke, M.B., M.A., Executive Director, American Social Hygiene Association, New York, N. Y.

Frank J. Condon, M.D., M.P.H., Senior Surgeon (R), U. S. Public Health Service; Executive Medical Officer, Office of Indian Affairs, Albuquerque, N. M.

A. Barklie Coulter, M.D., Director, Bureau for Tuberculosis, Health Dept., Washington, D. C.

Lyman C. Duryea, M.D., M.P.H., Medical Director, Research Council on Problems of Alcohol, New York, N. Y.

Oscar Felsenfeld, M.D., C.P.H., Research Bacteriologist, Mt. Sinai Medical Research Foundation, Chicago, Ill.

Franz Goldmann, M.D., Associate Professor, Harvard University School of Public Health, Boston, Mass.

Clarence F. W. Hames, M.D., D.P.H., Deputy Minister, Department of Public Health, Regina, Sask., Canada

John V. Killion, D.D.S., M.P.H., Public

Health Dentist, Dept. of Health, Philadelphia, Pa.

Irwin I. Lubowe, M.D., Medical Inspector, Bureau of Social Hygiene, City Dept. of Health, New York, N. Y.

Henry B. Makover, M.D., Associate Director, Montefiore Hospital, New York, N. Y.

Herbert Notkin, M.D., M.P.H., Medical Consultant, State Dept. of Vocational Rehabilitation, Sacramento, Calif.

John J. Ritter, Lt. Col., M.A.C., (Ret.), Assistant Administrator, Fordham Hospital, New York, N. Y.

Gordon H. Seger, Dr.P.H., Chief, State Personnel Administration Unit, U. S. Public Health Service, Washington, D. C.

Caroline R. Shreve, Director, Atlantic County Public Health Service, Atlantic City, N. J.

Henry Simon, M.D., M.P.H., Epidemiologist, Health Dept., Newark, N. J.

Norman D. Thetford, M.D., Chief Municipal Physician and Asst. Commissioner of Health, Christiansted, Saint Croix, Virgin Islands

Percy T. Watson, M.D., M.P.H., Director of Local Health Services, State Dept. of Health, St. Paul, Minn.

Lillian Wurzel, M.A., Medical Social Worker, Los Angeles Tuberculosis Sanatorium, Duarte, Calif.

APPLICATION FOR HOTEL ACCOMMODATIONS

American Public Health Association, October 6-10, 1947

NOTE: Single rooms are very limited in number. Please arrange to occupy twin-bedded rooms.

HOUSING BUREAU, 16 Central Pier, Atlantic City, N. J.

Please reserve the following:

Hotel . . . . . First Choice	Hotel . . . . . Fourth Choice
Hotel . . . . . Second Choice	Hotel . . . . . Fifth Choice
Hotel . . . . . Third Choice	Hotel . . . . . Sixth Choice

..... Room(s) with bath for ..... person(s). Rate \$ . . . to \$ ..... per room.

Arriving Atlantic City ..... A.M.  
..... hour . P.M. Leaving .....

NOTE: You will receive confirmation direct from the hotel accepting the reservation when made.

Rooms will be occupied by:

Name	Street Address	City	State
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....

SEVENTY-FIFTH ANNUAL MEETING  
AMERICAN PUBLIC HEALTH ASSOCIATION  
ATLANTIC CITY, N. J., OCTOBER 6-10, 1947

HOTEL RATES, ATLANTIC CITY, N. J.

BOARDWALK HOTELS

Hotels		Total Rooms	Rooms with Bath	
			Single	Double
AMBASSADOR	Brighton Ave.	670	\$6.00-\$9.00	\$9.00-\$14.00
APOLLO	New York Ave.	51		8.00- 12.00
BREAKERS	New Jersey Ave.	475	4.00- 7.00	5.00- 12.00
BRIGHTON	Indiana Ave.	291	7.00-	9.00- 14.00
CHALFONTE-HADDON HALL	North Carolina Ave.	1,000	6.00-10.00	8.00- 18.00
CHELSEA	Morris Ave.	400	5.25- 6.75	6.75- 15.00
CLARIDGE	Park Pl.	406	6.00-14.00	9.00- 17.00
DENNIS	Michigan Ave.	475	6.00- 8.00	9.00- 14.00
MARLBOROUGH-BLENHEIM	Park Pl.	464	6.00-10.00	9.00- 16.00
MAYFLOWER	Tennessee Ave.	280	5.00- 6.00	7.00- 12.00
NEW BELMONT	S. Carolina Ave.	100	5.00- 6.00	7.00- 12.00
PRESIDENT	Albany Ave.	500	7.00-10 00	9.00- 15.00
RITZ-CARLTON	Iowa Ave.	431	6.00- 8.00	9.00- 14.00
ST. CHARLES	St. Charles Pl.	300	5.00-12.00	7.00- 14.00
SEASIDE	Pennsylvania Ave.	235	5.00-11.00	8.00- 14.00
SHELBURNE	Michigan Ave.	300	6.00- 9.00	9.00- 12.00
STRAND	Pennsylvania Ave.	271	4.50- 6.00	9.00- 12.00
TRAYMORE	Illinois Ave.	600	6.00-14.00	9.00- 18.00

AVENUE HOTELS

Hotels		Total Rooms	Rooms with Bath	
			Single	Double
BOSCOBEL	Kentucky Ave.	120		\$8.00
CLARENDON	Virginia Ave.			7.00
COLTON MANOR	Pennsylvania Ave.	208	\$5.00-\$9.00	8.00-\$12.00
COLUMBUS	Pacific Ave. at St. James	100		6.00
CRILLON ★	Pacific Ave. at Indiana	49		8.00- 10 00
EASTBOURNE	Pacific Ave. at Park	75		7.50- 8.00
FLANDERS	St. James Pl.	125	5.00	7.00- 9.00
FOX MANOR	Pacific Ave. at Belmont	60		8.00- 10.00
HOLMHURST	Pennsylvania Ave.	100		7.00- 8.00
JEFFERSON	Kentucky Ave.	150	6.00	7.00- 10.00
KENTUCKY	Kentucky Ave.	110	3.50	6.00- 7.00
LAFAYETTE	N. Carolina Ave.	100	5.00- 6.00	8.00- 10.00
MADISON	Illinois Ave.	210	4.50- 6.00	7.00- 10.00
MONTICELLO	Kentucky Ave.	175		7.00
MORTON	Virginia Ave.	300	5.00- 6.00	7.00- 9.00
PENN-ATLANTIC	S. Carolina Ave.	125		7.00
RUNKMEDE	Park Pl.	75	4.00- 7.50	6.00- 10.00
SENATOR	S. Carolina Ave.	260	4.50- 7.00	7.00- 12.00
STERLING	Kentucky Ave.	83	4.00- 5.00	6.00- 7.00
VILLA D'ESTE	Pacific Ave. at Chelsea	40		8.00- 14.00

★ Rate Includes Breakfast

See Application Blank, preceding page

## APPLICANTS FOR MEMBERSHIP

*The following individuals have applied for membership in the Association. They have requested affiliation with the Sections indicated.*

### *Health Officers Section*

Clifford A. Bachrach, M.D., 670 East 18th St., Brooklyn 30, N. Y., Apprentice Epidemiologist, State Dept. of Health  
David E. Block, M.D., North Road, Madalin, N. Y., Health Officer, Town of Red Hook  
John M. Burnett, M.D., 507 Nanum, Ellensburg, Wash., Kittitas County Health Officer

Hsueh Chao-Sheng, M.D., Baltimore City Health Dept., Municipal Office Bldg., Baltimore, Md., Technical Expert, Ministry of Health, China

Edwin E. Corbett, 386 North Central Ave., Ramsey, N. J., Vice-President, Board of Health

Bernard J. Gioffre, M.D., 411 Westchester Ave., Port Chester, N. Y., Health Officer

Ellen Jiroudek, M.D., 33 Coddington Ave., Staten Island 6, N. Y., Health Officer-in-Training, New York City Dept. of Health

Alvin R. Leonard, M.D., M.P.H., 1240 Louisiana St., Vallejo, Calif., Medical Officer, State Dept. of Public Health

A. P. Merrill, M.D., 4422 Third Ave., New York 57, N. Y., Hospital Administrator, St. Barnabas Hospital for Chronic Diseases

C. Henry Murphy, M.D., Orpheum Bldg., Wichita, Kans., Director, Sedgwick County Dept. of Public Health

Donald J. Roop, M.D., Health Dept., Frederick, Md., Health Officer, State Dept. of Health

Andrew P. Sackett, M.D., 151 12th Ave., South Charleston, W. Va., Director, Bureau of Venereal Diseases, State Dept. of Health

Antonio Sobral de Cruz, M.D., Praca Batista Campos 145, Belem, Para, Brazil, S. A., Health Officer, Special Service of Public Health

Betty R. Berry, 5003 Hanna Place, S. E., Washington, D. C., Asst. Bacteriologist, Texas State Board of Health

Irving I. Cohen, 15 S. Gay St., Baltimore 2, Md., Chief Chemist, Straasburger and Siegel

June W. DeCelles, 4108-A West 61st St., Chicago, Ill., Senior Bacteriologist, Chicago Health Dept. Laboratory

Alvin L. Gleason, 410 N. First, Albuquerque, N. M., Senior Asst. Bacteriologist, Bernalillo County Health Dept.

Ruth E. Hollingsworth, Santa Maria Hospital, Santa Maria, Calif., Bacteriologist

Lt. Romey W. Keys, U. S. Public Health Service, American Legation, Monrovia, Liberia, Africa, X-Ray Technician

Annis E. Thomson, M.D., 34 East 51st St., New York 22, N. Y., Bacteriologist, Research Laboratory, City Dept. of Health

Louis F. Tomey, M.S., Route 1, Easton, Md., Assoc. Bacteriologist, Bureau of Labs., State Dept. of Health

Haskell S. Tubiash, M.S.P.H., U. S. Public Health Service, E. 3rd and Kilgour, Cincinnati, Ohio, Bacteriologist

### *Vital Statistics Section*

Jacob Baar, M.A., 135 Remsen St., Brooklyn 2, N. Y., Editor, Statistical Bulletin, Metropolitan Life Insurance Co.

Etta Bloom, 105 Homestead St., Roxbury, Mass., Statistician, State Dept. of Public Health

Carl J. Heisser, Navy Dept., Potomac Annex Bldg. 5, Room 5, Washington, D. C., Statistician, Medical Statistics Division, Bureau of Medicine and Surgery

Louis Pincus, 451 Kingston Ave., Brooklyn 25, N. Y., Statistician, Bureau of Records and Statistics, City Dept. of Health

Jules V. Quint, 77-40 141st St., Flushing, N. Y., Accident Statistics Analyst, Statistical Bureau, Metropolitan Life Insurance Co.

Henry Schlichting, Jr., N.D., P. O. Box 968, Midland, Tex., Chief of Staff, Midland Naturopathic Clinic

Sam Shapiro, 1900 F. St., N. W., Washington, D. C., Biostatistician, National Office of Vital Statistics

### *Engineering Section*

Richard Fenton, 479 Pennsylvania Ave., Brooklyn 7, N. Y., Health Inspector, Bureau of Sanitary Engineering, City Health Dept.

Joseph N. Lanoix, M.S., R. C. A. Communications, Port-au-Prince, Haiti, Chief Field Engineer, American Sanitary Mission, C. I. A. A.

Gerard A. Rohlich, Ph.D., University of Wisconsin, Hydraulic Lab., Madison, Wis., Assoc. Professor of Hydraulic and Sanitary Engineering

### *Industrial Hygiene Section*

George A. L. Johnson, N. Y. Naval Shipyard, Bldg. 122, Brooklyn, N. Y., Industrial Hygienist, U. S. Navy

John L. Norris, M.D., C.M., Kodak Park, Rochester, N. Y., Asst. Supt., Medical Dept., Eastman Kodak Co.

Howard K. Sessions, Capt., M.C., 913 Hillwood Ave., Falls Church, Va., Officer in Command, Sanitation and Health Branch, Bureau of Medicine and Surgery, Navy Dept.

Robert C. Yeager, 100 East Court, Cincinnati 2, Ohio, Managing Partner, Rose Exterminator Co.

#### *Food and Nutrition Section*

Helen L. Gillum, Ph.D., 1575 Life Sciences Bldg., Berkeley 4, Calif., Assoc. Professor of Nutrition and Dietetics, Univ. of California

Gretchen J. Hartman, 2517 St. Paul, Baltimore, Md., Consultant Dietitian, State Dept. of Health

Alexander V. Karmiloff, UNRRA, China Mission, Shanghai, China, Health Inspector

Lela A. Mackey, M.S., State Board of Health, Raleigh, N. C., Junior Nutritionist

Anne R. Matthews, M.P.H., 2517 St. Paul St., Baltimore, Md., Chief Nutritionist, State Dept. of Health

Concha Mendoza, Montefiore Hospital, Gun Hill Rd., New York 67, N. Y., Student Dietitian

Colonel Herbert K. Moore, V.C., Surgeons Office, Hqs., Army Ground Forces, APO 958, San Francisco, Calif., Veterinarian

Chloe A. Yates, Lee County Health Dept., Tupelo, Miss., Nutrition Consultant, State Board of Health

#### *Maternal and Child Health Section*

Dr. Ernesto Arango-Escobar, Direccion Municipal de Higiene, Medellin, Colombia, S. A., Director

Paul A. Harper, M.D., M.P.H., 615 N. Wolfe St., Baltimore, Md., Assoc. Professor, Dept. of Public Health Administration, Johns Hopkins School of Hygiene and Public Health

Robert E. Jewett, M.D., M.S.P.H., 1098 W. Michigan, Indianapolis 7, Ind., Director, Division of Maternal and Child Health, State Board of Health

Eileen E. Lester, 188 W. Randolph St., Room 2207, Chicago, Ill., Regional Medical Social Consultant, U. S. Children's Bureau

#### *Public Health Education Section*

Hilda Cloud, 1510 T-6, U. S. Public Health Service, Bethesda, Md., Scientific writer and Liaison Officer, Cancer Control

Walter I. Ettleman, 103½ W. Central Ave.,

Albuquerque, N. M., State Representative, National Foundation for Infantile Paralysis, Inc.

Marguerite M. Flynn, 4107 18th Ave., Brooklyn 18, N. Y., Staff Asst., Statistical Bureau, Metropolitan Life Insurance Co.

Elmer B. Gibson, 11 North Pearl St., Room 712, Albany, N. Y., Eastern New York State Representative, National Foundation for Infantile Paralysis, Inc.

Joseph A. Knight, M.S., 511 Exchange Ave., Endicott, N. Y., Student, School of Public Health, Columbia Univ.

Charles R. MacIvor, Life and Health, Takoma Park, Washington 12, D. C., Advertising Manager

Jean M. Martin, M.P.H., Dillard University, New Orleans, La., Asst. Professor of Nursing

Hazel O'Hara, 3626 Davis St., N. W., Washington 7, D. C., Information Specialist, Institute of Inter-American Affairs

W. Doyle Reed, 3609 Military Rd., N. W., Washington 15, D. C., Chief, Insect and Rodent Control Section, Office of Chief of Engineers, War Dept.

I. D. Robbins, Box 18, San Francisco, Calif., Interested Citizen

Rose Sherman, 1 Madison Ave., New York 10, N. Y., Director of Exhibits, Health and Welfare Division, Metropolitan Life Insurance Co.

Alice W. Smith, 3305 82nd St., Jackson Heights, N. Y., Public Health Research, Metropolitan Life Insurance Co.

Mrs. I. H. Teilman, 2110 Merced St., Selma, Calif., Chairman of Health, California Federation of Women's Clubs

Mayton O. Zickefoose, M.S., 2411 N. Charles St., Baltimore 18, Md., Asst. Nutritionist, State Dept. of Health

#### *Public Health Nursing Section*

Lois M. Bachmann, 30 Blodgett, Clarendon Hills, Ill., Staff Nurse, Cook County Dept. of Public Health

A. Evelyn Burke, M.A., 1008 Yale Ave., N., Seattle, Wash., Director of Public Health Nursing Education, King County Health Dept.

Jessie M. Dawson, R.N., 55 N. Elliott Place, Brooklyn 1, N. Y., Supervising Public Health Nurse, City Dept. of Health

Charlotte L. Decker, 54 Queen Anne Rd., Bogota, N. J., Educational Director, Visiting Nurse Assn. of the Oranges

Rose A. Godbout, R.N., Hidalgo County Health Unit, Edinburg, Tex., Director of Nurses

Eleanor J. Leckner, R.N., 4321 W. Broad-



- way, Robbinsdale, Minn., Staff Nurse, Community Health Service
- Mary Matthews, R.N., 2321 Canal, New Orleans, La., Asst. Nurse Officer, U. S. Public Health Service
- Rita A. Nielsen, R.N., Winfield Hospital, Winfield, Ill., Supt. of Nurses
- Dorothy M. Percy, 66 Craig St., Ottawa, Canada, Chief Supervisor of Nurses, Civil Service Health Division, Dept. of National Health and Welfare
- Ethel K. Prestrud, 814 Main St., Mount Vernon, Ill., Nursing Consultant, Division of Services for Crippled Children, Univ. of Illinois
- Margaret A. Schwem, R.N., 109 S. 9th St., Olean, N. Y., Student, School of Public Health, Columbia Univ.
- Anna M. Voelker, Colorado Bldg., Apt. 8, Beverly Park Gardens, Alexandria, Va., Exec. Director, Alexandria Visiting Nurse Service
- Dorothy E. Watkins, P. O. Box 88, Point Pleasant, W. Va., Public Health Nurse, State Health Dept.

#### *Epidemiology Section*

- Catherine H. Brewer, M.D., 808 Ocean Ave., Jersey City, N. J., Health Officer, State Dept. of Health
- Philip K. Condit, M.D., 5555 Lawton Ave., Oakland 11, Calif., Epidemiologist, Oakland City Health Dept.
- Robert J. Huebner, M.D., National Institute of Health, Bethesda, Md., Senior Asst. Surgeon, U. S. Public Health Service
- Percy E. Moore, M.D., D.P.H., Dept. of National Health & Welfare, Ottawa, Ont., Canada, Director, Indian Health Services
- Ottavio J. Pellitteri, 32-57 45th St., Astoria 3, N. Y., Epidemiologist, City Dept. of Health
- Lillian Phillips, 22 Harrison St., Pittsburgh 5, Pa., Student, Univ. of Pittsburgh
- Lt. Col. Harry J. Robertson, V.C., Medical Field Service School, Brooke AMC, Ft. Sam Houston, Tex., Acting Director, Dept. of Extension Courses, Brooke Army Medical Center
- Nelson W. Stroh, M.D., 289 Linwood Ave., Buffalo, N. Y., Chief, Diagnostic Clinic, City Dept. of Health

#### *School Health Section*

- Madison W. Foster, M.D., 1241 Desiard, Monroe, La., School Clinician, Grambling College
- Florence M. Hellman, M.A., 132 Sherman, Kent, Ohio, Health Coordinator, Kent State Univ.

Marian H. Hosford, M.A., 1634 E. 7th St., Brooklyn 30, N. Y., School Health Educator, New York Tuberculosis and Health Assn.

Dorothy Lottridge, M.D., 1543 "O" St., Fresno, Calif., Medical Officer, State Dept. of Public Health

J. Robert Lyman, M.D., 24 Forest St., Wellesley Hills, Mass., School Physician, Town of Wellesley

#### *Dental Health Section*

- Arthur Bushel, D.D.S., M.P.H., 39 Columbia St., Albany 7, N. Y., Senior Dentist, Dental Bureau, State Dept. of Health
- Vernon J. Forney, D.D.S., M.P.H., 4604 S. Chelsea Lane, Bethesda, Md. 14, Chief Dental Section, Industrial Hygiene Division, U. S. Public Health Service
- Dr. Esther Saaavedra, 253 W. 24th St., New York, N. Y., Chief, Section of Odontology, Center of Hygiene, Servicio Cooperativo Inter-Americano de Salud Publica, Bogota, Colombia

#### *Unaffiliated*

- Ralph C. Barnes, M.S., 605 Volunteer Bldg., Atlanta, Ga., Senior Asst. Scientist (Entomologist), U. S. Public Health Service
- Deane F. Brooke, M.D., 3945 Connecticut Ave., Washington, D. C., Medical Consultant, U. S. Public Health Service
- Charles W. A. Hammick, Council Chambers, Molesworth St., Lismore, N. S. W., Australia, Chief Health Inspector, Lismore City Council
- Archie D. Hess, Ph.D., Tennessee Valley Authority, Wilson Dam, Ala., Chief, Biology Staff, Health and Safety Dept.
- Elizabeth J. McEvoy, 27 Norton, Waterbury, Conn., Bacteriologist, Health Dept. Lab.
- Sidney I. Wolfson, M.S.P.H., 29 McDermott St., Freehold, N. J., Field work with Nassau County Health Dept.

#### DECEASED MEMBERS

- J. Cyril Eby, M.D., Plaquemine, La. Elected Member 1930, Health Officers Section
- Leslie L. Lumsden, M.D., New Orleans, La., Elected Member 1909, Laboratory Section
- Ira C. Miller, M.D., Camp Hill, Pa., Elected Member 1939, Epidemiology Section
- Karel Charles Pur. M.D., Brno, Czechoslovakia, Elected Member 1947, Industrial Hygiene Section
- Courtney Smith, M.D., Dr.P.H., Washington, D.C., Elected Member 1937, Elected Fellow 1942, Health Officers Section

## EMPLOYMENT SERVICE

The following pages present information for those seeking qualified public health personnel and for those seeking positions in public health.

This is a service of the Association conducted without expense to the employer or employee.

Address all correspondence to the Employment Service, A.P.H.A., 1790 Broadway, New York 19, N. Y., unless otherwise specified.

### POSITIONS AVAILABLE

(Supplemental to list in August Journal)

**Trained Laboratory Aids and Bacteriologists** needed in Wisconsin Civil Service. Three weeks' vacation with pay, sick leave, retirement benefits, permanency. Laboratory aids' salaries beginning at \$155 and \$180 a month. Bacteriologists at \$190 a month. For further information write to the Bureau of Personnel, State Capitol, Madison 2, Wis.

**Wisconsin Civil Service Vacancies:** Medical specialists in public health II (tuberculosis control)—beginning monthly salary of \$505. District health officers—beginning monthly salary of \$430. Three weeks' vacation with pay, sick leave, retirement benefits, permanency. For further information write to the Bureau of Personnel, State Capitol, Madison 2, Wis.

**Graduate in Bacteriology** with some background in chemistry and experience in field of sewage and water research or treatment. To take charge of section in newly organized research project, Eastern United States. Salary \$3,200-\$4,200 depending upon qualifications. Write Box L-535, Employment Service, A.P.H.A.

**Director of Nutrition** for Red Cross Chapter in a midwestern metropolitan center. Candidate must have sound nutrition background and experience in community activity. Excellent opportunity to develop a broad program on a long-term basis with coöperation from health, education, social welfare, and business leaders. Salary open. Write Box E-3, Employment Service, A.P.H.A.

**Positions are open in Georgia** for county and district commissioners of health. Salaries for experienced public health physicians range from \$6,600 to \$7,500. Salaries for physicians with public health training who are entering the field range from \$5,640 to \$6,840. Liberal travel allowances supplement these salaries. Tenure of office is assured by a merit system. License to practise medicine in Georgia is required. Ample opportunities for training are offered with liberal stipend while in training. Write T. B. Abercrombie, M.D., Director, State

Health Department, State Office Building, Atlanta 3, Ga., for application forms and full details.

1. **Sanitary Engineer** with training and experience. Maximum salary \$4,200.

2. **Sanitarian** with experience in food and milk control, salary up to \$3,000, for County Health Department, Southeast. County seat in large urban center. Write Box E-516, Employment Service, A.P.H.A.

**Physician** with experience or training in public health for Director of County health unit; headquarters in Bisbee, Ariz.; population 39,000; salary dependent upon training and experience; liberal flat rate for travel allowance. Apply Cochise County Health Service, Box 1193, Bisbee, Ariz.

**School Physician** for school district with a school population of more than 10,000. To take complete charge of the elementary program. Salary approximately \$6,000. West Coast. Write Box D-3, Employment Service, A.P.H.A.

**Sanitarian** with experience in food handling and restaurant sanitation. Age 25 to 40 preferred. Health department experience necessary. Starting salary \$3,000 plus ample travel allowance. Must be well educated and diplomatic. State education, experience, and age in reply. Must have own car. State of Wyoming. Write State Health Officer, Cheyenne, Wyo.

**Physician** for director of the health department medical services and to be assistant to the director of public health in one of the larger cities in Michigan. The work comprises supervision of child health conferences and school health programs, and communicable disease control including conduct of venereal disease clinics. Graduate from approved medical school with Michigan license. At least one year's public health training and experience preferred. Full-time position under merit system, opportunity for advancement. Vacation and sick leave and

travel allowances. Salary dependent on qualifications. Give full particulars in first letter and earliest date available. Write Box J-2, Employment Service, A.P.H.A.

1. District Health Officers, salary range from \$5,160-\$6,060 (including \$30 per month cost of living bonus). Requirements: physician licensed to practise medicine in Wisconsin or eligible for license; under fifty years. The physicians selected under state Civil Service requirements would be eligible for an academic year of public health training at a generous stipend.

2. Director of the Tuberculosis Control Division (Medical Specialist in Public Health II). Salary \$6,060-\$7,260 (including \$30 per month cost of living bonus). Requirements: physician, licensed to practise medicine in Wisconsin or eligible for license; degree from a recognized school of public health; three years' experience in the administration of public health activities. Special training and experience in the field of tuberculosis control desirable and may be substituted for the public health training and experience requirements. Write Wisconsin State Board of Health, Madison, Wis., for application blanks.

Physician for position in Michigan. Prefer pediatrician with training in public health, but will consider physician with public health training and experience in the field of maternal and child health. This is a special project and will be both interesting and stimulating. Salary \$6,000 plus car allowance of 6¢ a mile. For further details contact Robert F. Hall, M.D., Director, Isabella County Health Department, Mt. Pleasant, Mich.

Director of School Health Program. Full-time physician, \$6,000. To direct a County-wide program including Bethesda, Chevy Chase, Silver Spring, Tacoma Park, and other suburban and rural communities of Montgomery County adjacent to the District of Columbia. A challenging opportunity for a physician interested in a career in school health. Apply to County Health and Education Departments, Rockville, Md.

Experienced Laboratory Technician as chief technician of hospital laboratory, Northeast. College degree and several years' experience in bacteriology or chemistry. Military experience as laboratory officer highly regarded. Minimum starting salary \$3,600. Write Box L-537, Employment Service, A.P.H.A.

1. Senior Serologist. Requirements: Bachelor's degree and one year graduate

work in acceptable college or university, and two years' experience in same type of work.

2. Senior Water and Milk Bacteriologist. Requirements: Bachelor's degree with one year's graduate work in an acceptable college or university, and two years' experience in same type of work.

3. Junior Biologist, two. Requirements: Graduation from an acceptable college or university with major in biological subjects, preferably in bacteriology and serology. Address inquiries to C. F. Adams, M.D., State Division of Health, Jefferson City, Mo.

Health Commissioner for County of 40,000, Midwest. Possibility of including three cities located in the county in the County Unit. Salary open. Write Box K-2, Employment Service, A.P.H.A.

Physician as Director City-County Health Department, Eau Claire, Wis., population 56,000; staff of 14; ideal offices and laboratory. Salary for man with degree in public health \$6,180 plus 6¢ per mile travel. Write Charles K. Kincaid, M.D., City-County Health Department, Safety Bldg., Eau Claire, Wis.

1. District Health Officer. Starting salary \$4,800 plus \$1,500 travel for personally owned car. Applicants over 45 years of age must have had previous experience in a full-time public health position.

2. Venereal Disease Clinician. Salary \$4,500.

3. Senior Bacteriologist-Serologist. Salary \$3,300.

4. Senior Assistant Bacteriologist-Serologist. Salary \$2,400.

5. Junior Bacteriologist-Serologist. Salary \$2,100. Positions are with the New Mexico Department of Public Health. For position requirements and application forms write: Merit System Supervisor, P. O. Box 939, Santa Fe, N. M.

Bacteriologist in state branch laboratory, State of Colorado. Required: college degree with specialization in bacteriology. No residence requirement. Beginning salary \$2,400, advancement possible. Write Dr. R. L. Cleere, M.D., Executive Director, State Department of Public Health, 414 State Office Building, Denver, Colo.

Public Health Staff Nurses for generalized program under supervision. Salary range \$225-\$275. Liberal car allowance. Write: Public Health Nursing Section, Oregon State Board of Health, 1022 Southwest Eleventh Avenue, Portland 5, Ore.

**Public Health Nurses** with training and experience for county health departments in Virginia. Salary range \$2,563 to \$3,360 plus travel. Liberal vacation provisions. Write State Health Commissioner, State Office Building, Richmond 19, Va.

**Nurses for Tuberculosis Sanatoria** (white and Negro) in Virginia. Salary for supervisor \$2,428, for general duty nurse \$2,160. Write State Health Commissioner, State Office Building, Richmond 19, Va.

**Director and Staff Nurses** for generalized program in City and County of 105,000 population. Educational and cultural center including three colleges. Salaries based upon qualifications for staff nurses ranging from \$2,900-\$3,440, and for Director \$3,500-\$3,700 per year plus travel. Apply: Health Department, Kalamazoo, Mich.

**Public Health Nurses** for generalized nursing program. Vacancies exist for graduate nurses to be trained as Public Health Nurses. Salaries range from \$2,644.80 to \$3,397.20 (P-1 grade). Public Health Nurses' salaries range from \$3,397.20 to 4,149.60 (P-2 grade). Write to Dr. George C. Ruhland, Health Officer, or Mrs. J. P. Prescott, Director, Bureau of Public Health Nursing, District of Columbia Department of Health, Washington, D. C.

**Public Health Nurses**, Baltimore County Health Department. Population 250,000; urban, suburban, and industrialized areas; county seat 8 miles from Baltimore. Generalized service; director, 4 supervisors, 25 field nurses. Immediate large expansion planned. Beginning salary \$2,300 (for trainee) to \$2,700, depending on experience and education. Opportunity for increases up to \$3,300. Retirement plan; one month's vacation; 5 day, 35½ hour week sick leave. For use of personal car, allowance of 7 cents per mile. Write to Dr. William H. F. Warthen, Health Officer, Baltimore County Health Department, Towson 4, Md.

**Staff Public Health Nurse** for Department of Public Health, Oak Ridge, Tenn. Generalized Nursing Service for city of 35,000 population. Industry in connection with research and development of nuclear power. Minimum salary \$2,709 per annum. Forty hour work week. Car furnished for all official work. Apply: Charles H. Benning, M.D., M.P.H., Director of Public Health, P. O. Box 486, Oak Ridge, Tenn.

**Public Health Nurses** with Certificate. Salary \$230 per month; 40 hour week. Generalized program; opportunity for advancement. Write J. B. Eason, M.D., Director City Health Department, Spokane, Wash.

**Two Public Health Nurses** to teach in midwestern university. One responsible for certificate level program. One to develop program of study for graduate nurses preparing to integrate social and health aspects in basic schools of nursing. Must have Master's degree and a good combination of public health nursing experiences including supervision. Preference given to those with teaching experience. Beginning salary \$4,000 for ten month contract. Write Box N-398, Employment Service, A.P.H.A.

**Public Health Nurses** for generalized program. Atomic energy project in State of Washington. Salary range \$62.80 to \$69.70 for forty hour work week. Automobiles furnished for work. Write Business Office, Kadlec Hospital, Richland, Wash.

**Public Health Nurses** are needed in Georgia: The State and County Departments of Public Health in Georgia invite qualified public health nurses to apply for permanent positions in Georgia. Staff nurses must have a minimum of six months' postgraduate public health nursing education in addition to acceptable basic training. Salaries range from \$2,100 to \$2,340 in addition to a liberal travel allowance. Supervisory nurses must have at least two years' experience in public health nursing as well as one academic year of postgraduate training in public health training in public health nursing. Salaries range from \$2,400 to \$3,000 in addition to travel allowances. Scholarships are available for graduate nurses who are interested in receiving public health nursing training. Write Personnel Administrator, State Health Department, State Office Building, Atlanta, Ga., for application forms and full details.

**District Health Officers** for the State of Washington. Requirements: Graduation from an approved medical school, one year internship and 3 years in professional medical work; or 1 year in professional medical work and 1 year's study in school of public health. Salary \$6,000 to \$7,140. Exceptional candidates can start above the minimum level. Write State Personnel Board, Washington State Department of Health, Smith Tower, Seattle 4, Wash.

**Assistant Chief Bacteriologist, Ph.D.,** with major in bacteriology and minor in chemistry. Position to direct bacteriological research group on vaccines, antibiotics and new chemo-therapeutic agents of well established midwest pharmaceutical company near large city. Some training or experience in immunology, serology, antibiotics, animal experimentation is desirable. Salary commensurate with training or experience. Write Box N-3, Employment Service, A.P.H.A.

**Public Health Nurses,** county health department, southern Michigan. Requirements: R.N. degree plus two semesters at School of Public Health Nursing. Salary without experience: \$2,400 to \$2,700. With at least one year's public health experience: \$2,700 to \$3,000. Liberal travel allowance. Write Box L-4, Employment Service, A.P.H.A.

**Associate Bacteriologist,** College degree, one year training in public health laboratory, two years' experience. Five day week. Salary \$2,750. Write William A. Dorsey, Laboratory Director, Arlington County Laboratory, P. O. Box 151, Arlington, Va.

**Sanitary Chemist or Engineer** for staff position in engineering school, southeast. To do research work (methods of water and sewage analysis) which can be applied toward advanced degree; also will have to carry some undergraduate teaching. Write Box E-512, Employment Service, A.P.H.A.

**Director of Public Health Nursing** for Columbia County Dept. of Health. Apply: Columbia County Dept. of Health, 612 Warren Street, Hudson, N. Y.

**Health Officers (M.D.)** for several important city-county and other local health department openings in West Virginia. Some of the positions carry teaching responsibilities, implementing the basic salary of \$6,000. Physicians are encouraged to apply even if lacking public health training or experience; must be below 35 years at first public health appointment. Write Bureau of County Health Work, West Virginia Dept. of Health, Charleston, W. Va.

**Specialized Consultant Nurses** in the following programs—Tuberculosis, Maternal and Child Health, School Health Service. Requirements include bachelors degree with major in public health nursing, advanced preparation in the specialty and one year of experience in generalized supervision. Travel allowance. Salary open. Write Director, Division of Public Health Nursing, State Board of Health, Jackson, Miss.

**Negro M.D.—Assistant Director School Health Service** in Nashville, Tenn. Public Health experience desirable but not absolutely necessary. Staff of three doctors and twelve nurses doing broad school health program in metropolitan area. Chance to affiliate with Meharry Medical School. Salary open, 12 months. Eligible for Civil Service if under 40. Communicate Director School Health Service, Nashville, Tenn.

**Health Officer** wanted, September through June to substitute while on educational leave. Illinois County of 35,000, 100 miles from Chicago. Salary \$515 per month plus \$60 month's travel. Two weeks sick leave and three weeks vacation leave provided, annually. Lee County Health Department, 123 East First Street, Dixon, Ill.

**Experienced, trained man** for Public Health Executive position in San Mateo County, California. Starting salary \$7,788 per year, increasing annually over four years to \$9,732. Write Civil Service Commission, Courthouse, Redwood City, Calif.

**Industrial Hygiene Chemist,** five years' experience. Graduate of accredited college with major in chemistry. Salary \$325-\$425 per month, plus travel expenses. State Civil Service position with vacation, sick leave, and retirement privileges. Send brief outline with request for application form to State Health Officer, Louisiana State Department of Health, New Orleans 7, La.

**City Biochemist.** \$400 to \$500 per month plus \$48.96 cost-of-living. Two years' practical experience directing biological laboratory or comparable experience; postgraduate training equivalent to M.A. and preferably Ph.D. in one of the sanitary sciences. Applications received until needs of service filled. Write Personnel Department, City Hall, Madison 3, Wis.

**Industrial Hygiene Physician.** Minimum of three years' medical experience with major emphasis in the field of Industrial Hygiene, supplemented by one year postgraduate training in a school of public health with studies in Industrial and Occupational disease control. Salary range: \$6,000 to \$7,200. Start exceptionally well qualified person at \$6,480. Under Civil Service and Retirement. Apply to: Mr. A. T. Johnson, Personnel Director, Oregon State Board of Health, 1022 S.W. 11th Avenue, Portland 5, Ore.

**Associate Bacteriologist** in charge of clinical laboratory in Eastern State Health Department. B.S. degree plus three years' experience, thorough foundation in chem-

istry and background in bacteriology are requisites. New position with teaching duties. Beginning salary \$3,600, annual increments. Write Box I-3, Employment Service, A.P.H.A.

**Bacteriologist for Director of Laboratory, State Health Department.** Ph.D. required. Background in serology, clinical bacteriology, and public health necessary. Salary range \$4,560-\$5,460. Write Box B-3, Employment Service, A.P.H.A.

**Public Health Nurse**—In Out-patient department, for follow-up work and Supervision of clinic. Secretary; station wagon furnished. Salary \$175 per month and full maintenance. Ideal working and living conditions. Must be between ages of 22 and 45. Contact Paul D. Grimm, M.D., Boehne Tuberculosis Hospital, Evansville 12, Ind.

**Several Qualified Public Health Officers** in Texas. Salary range \$5,500 to \$7,500 per year plus travel allowance. Apply to: Dr. Geo. W. Cox, State Health Officer, Austin, Tex.

**Physical Therapists and Senior Physical Therapists** for State Health Department. Physical therapists must be graduates from a school of physical therapy approved by the A.M.A. and registered in the American Registry of physical therapists. Salary \$220-\$260 per month. Senior positions require two years' experience. Salary \$250-\$300 per month. Write Merit System Supervisor, State Personnel Board, Seattle 4, Wash.

**Health Officer** for Saint Joseph, Mo. Graduation in medicine from a grade A medical school and not less than two years of full-time experience in public health work, or, one year of such full-time experience and the completion of a course in public health of not less than one year in residence at a recognized institution of learning required. Write E. C. Jenkins, Clerk, Board of Health, Saint Joseph, Mo.

**Public Health Nurse** for generalized Public Health Program. Salary to start \$2,500. Must register in Connecticut. City of 40,000 people. Five Parochial Schools included in work. Dependability a necessity. Retirement Fund. Must drive car. Apply: Health Officer, 47

Main Street, Bristol, Conn. Give qualifications and experience.

**Two Public Health Nurses** for growing Health Department in southeastern Michigan. Opportunity to work under supervision. Also opportunity for some post-graduate training at nearby School of Public Health. Must have completed one year in recognized school of Public Health. Salary range \$2,400-\$2,600, plus travel. Write H. C. Huntley, M.D., Director, Lenawee County Health Department, Adrian, Mich.

**Director of Industrial Hygiene** in West Virginia State Department of Health, Charleston. Salary \$6,000 plus travel. Position under state merit system. Qualifications: M.D. with two years' full-time professional experience in the field of industrial hygiene. Must be eligible for West Virginia license. Write Dr. N. H. Dyer, State Health Commissioner, State Department of Health, Charleston 5, W. Va.

**County Health Officers** in the West Virginia State Department of Health. Salaries from \$4,400 to \$6,000 per annum, plus travel allowance, depending on training and experience. Position under state merit system. Qualifications: M.D. with at least two years of full-time professional experience in the field of public health. Must be eligible for West Virginia license. Write Dr. N. H. Dyer, State Health Commissioner, State Department of Health, Charleston 5, W. Va.

**Health Officer** for newly established Bi-County Health Department in Central Illinois. Combined population approximately 33,000, mostly agricultural. Staff of eight contemplated. Trained and experienced physician wanted to fill the position. Excellent public support. Salary \$7,200 plus travel. Write: Mr. E. R. Rinehart, Secretary, DeWitt-Piatt County Board of Health, Farmer City, Ill.

**Public Health Nurses** in official generalized program of Washtenaw County, Michigan, at Ann Arbor. Agency is field teaching center for University of Michigan. Opportunity to study at University. Beginning salary \$2,700, \$600 travel allowance. Write for details to Nursing Director, 720 E. Catherine St., Ann Arbor, Mich.

## POSITIONS WANTED

**Position in School Health Education or Community Organization in public health.** Seventeen years' experience in teaching and community organization in public health. M.S.P.H. from a leading university. East or Middle West preferred. Write Box H-538, Employment Service, A.P.H.A.

**Sanitary Engineer** with five years' experience in public health engineering, including waste disposal, insect control, and industrial sanitation, desires position in the East. M.S. degree in Sanitary Engineering. Veteran, age 29. Reply Box E-510, Employment Service, A.P.H.A.

**Public Health and Sanitary Engineer.** Master's degree in sanitary engineering. Experience: District Engineer with State Health Department 4 years; Sanitary Corps U. S. Army 4 years; consulting Sanitary Engineer 2 years. Some teaching experience. Seeks position in official agency, private industry or teaching institution. Write Box E-518, Employment Service, A.P.H.A.

**Recent Graduate Veterinarian (KSC '47)** desires employment. Has had experience working for the Health Department of the District of Columbia. Age 32, married, no children. Write Box V-304, Employment Service, A.P.H.A.

**Position as Educational Research Worker** in public health and/or community educator with special reference to planning and organizing programs in sanitation and other phases of public health. Trained in education, social work and public health, with doctorate in latter field. Writing experience with public health agencies in preparing copy for newspaper and other publications; several years of field experience in sanitation. Position in west or mid-west preferred. Write Box C-3, Employment Service, A.P.H.A.

**Parasitologist, male, 28 years old, B.S.,** some graduate training. Six years' experience in the field of parasitology in civilian governmental agency, army, university and industrial laboratory. Experience includes routine examinations, field work and research in parasitology and some serology. Write Box L-533, Employment Service, A.P.H.A.

**Former Sanitary Engineer (RC) Public Health Service,** long experience, now employed, desires position sanitary engineer or director sanitation with municipal or local health unit. Write Box E-514, Employment Service, A.P.H.A.

## NEW YORK CITY HEALTH DEPARTMENT ANNOUNCES EXAMINATION FOR DIRECTOR OF PUBLIC HEALTH NURSING SERVICE

An examination for the position of Director of Public Health Nursing Service will be held in New York City this fall. Candidates must be graduates of an approved school of nursing; hold a baccalaureate degree registered by New York State; have ten years' experience in public health nursing, five of which must have been in a responsible administrative capacity. A combination of training and experience which is an equivalent of the above is permissible. Citizenship and residence requirement. Beginning salary range \$5,000-\$6,500 plus 10 per cent cost of living adjustment. Applications must be filed before September 30, 1947. Application blanks must be collected and submitted personally or by agent of the applicant at 96 Duane Street, New York 7, N. Y.

## PUBLIC HEALTH OPPORTUNITIES FOR PHYSICIANS IN THE STATE OF ILLINOIS

The Illinois State Department of Health announces a number of opportunities for physicians as described below. For detailed information address Roland R. Cross, M.D., Director, Illinois State Department of Health, Springfield, Ill.

1. Two vacancies exist in State Health Districts in southeastern and west central Illinois. Trained and experienced public health physicians are wanted as State District Health Officers. Salary range \$5,760-\$6,960, starting salary depending on qualifications. Civil service retirement and sickness benefits. Opportunity for advancement.

2. An examination will be held on October 27 in Chicago to provide a list of candidates for the openings in the Champaign-Urbana and in the Stickney Health District. Requirements: M.D. (AMA approved); Internship (AMA approved); one year postgraduate study in public health plus two years' public health experience or three years' public health experience; eligibility for Illinois licensure. Salary: Champaign-Urbana . . . maximum beginning \$7,200; Stickney . . . \$7,000. Admission to the examination only with certificates granted prior to examination.

3. A vacancy for a well qualified health officer exists at the DuPage County Health Department. Population 103,480, suburban to Chicago, and farming community. Beginning salary \$6,000-\$7,200 depending on training and experience.

## NEWS FROM THE FIELD

### NEW ENGLAND HEALTH INSTITUTE

#### RESUMES

A 1947 session of the New England Health Institute was held in Durham, N. H., June 16-18 under the auspices of the 5 New England State Departments of Health with the New Hampshire State Department and the University of New Hampshire hosts to more than 800 registrants.

Among the features of the three day meeting was the first joint sectional meeting at which several speakers emphasized the importance of community participation, not only in backing the health officer, but in real coöperative program planning. There was an admirable survey presented of what the Hospital Survey and Construction Act can mean to a local community both from the standpoint of bricks and mortar and from the standpoint of building a coördinated community health program.

Professor Ira V. Hiscock of Yale presented an excellent review of the problem of district health units in New England which involves town and city relationships somewhat different from the rest of the United States. Other features of the program included emphasis on health education, geriatrics, cancer and mental hygiene, as well as on industrial hygiene.

W. Lloyd Aycock, M.D. of Harvard presented a fruitful and suggestive analysis of the broader problems of epidemiology as applied to poliomyelitis.

The last session of the Laboratory Section indicated real progress in the laboratory diagnosis of influenza and in the classification and recognition of the cause of enteric infections.

An unusual list of prominent speakers featured the program and a resolution was unanimously passed urging the United States Congress to approve adherence by the United States to the Constitution of the World Health Organization.

### CUBA APPOINTS NEW DIRECTOR GENERAL OF HEALTH

On June 11 Dr. Ramon Grau San Martin, President of the Republic of Cuba, appointed Dr. Luis Espinosa y G. Caceres as Director General of Public Health. Dr. Espinosa has been serving as Director of the Division de Relaciones Medicas y Sanitarias Pan-americanas in the Cuban Government.

### DR. SCHEELE TO HEAD NATIONAL CANCER INSTITUTE

At the recent quarterly meeting of the Advisory Council of the National Cancer Institute, the resignation of R. R. Spencer, M.D., as Chief of the Institute was announced, effective July 1. He was succeeded by Leonard A. Scheele, M.D., formerly Assistant Chief of the Institute.

Dr. Spencer will remain with the Institute and in his own words is "shedding the constantly increasing load of administrative duties in order to spend full time on the two phases of the cancer program that interest me most—professional education and research."

At the same meeting, the appointment of Dr. A. C. Ivy, Vice President of the University of Illinois and one of the country's leading physiologists, as Executive Director of the National Cancer Advisory Council was announced.



TYPHUS COMMISSION MEDAL TO  
COL. RUDOLPH

Myron P. Rudolph, Colonel, MC, AUS, was awarded the United States of America Typhus Commission Medal recently by the War Department.

The citation notes that he "distinguished himself by exceptionally meritorious service in . . . the work of the Commission, by planning and supervising with marked ability and conspicuous success the administration . . . of details for the control of a typhus fever epidemic raging in the midst of thousands of concentration camp internees . . . He rendered invaluable service by organizing in the Dachau camps and in Southern Bavaria medical units and agencies on a large scale maneuver to bring the typhus epidemic under control."

STOVALL CANCER AWARD ESTABLISHED  
IN WISCONSIN

It has been announced in Madison, Wis., by the State Division of the American Cancer Society that an award honoring William D. Stovall, M.D., who is President-Elect of the Wisconsin Medical Society and Director of the State Laboratory of Hygiene, has been established. An annual award of \$250 will be made to a Wisconsin resident student at the University whose primary academic interest is related to cancer. According to the announcement the grant has been created as a tribute to Dr. Stovall for his years of faithful service to the cancer organization and in recognition also of his accomplishments in developing a public consciousness of malignant growths. The first award was made on May 26 to a veteran enrolled in biochemistry, Myrton C. Rand.

NEED A PATENT FREE?

The Office of the Solicitor, U. S. Department of the Interior, has recently advised the Association of certain

patents which have been assigned to the Secretary of the Interior and which are available for licensing. Such licenses are customarily used on a non-exclusive royalty-free basis. The announcement goes on to say that it is the desire of the office of the Solicitor to see the patents as widely used as possible.

From the titles, most of the material listed would not have any application to public health activities. Two titles, however, "Water Survey Apparatus," and "Production of Potable Water from Saline Solutions," indicate some possible application to the field of public health.

Anyone desiring further information should address the Solicitor, Department of the Interior, Washington 25, D. C.

DR. PORTERFIELD APPOINTED OHIO  
DIRECTOR OF HEALTH

John D. Porterfield, M.D., M.P.H., has been appointed Director of Health of the State of Ohio by Governor Herbert, effective August 1. Dr. Porterfield, who is a native of Chicago, received his Medical Degree in 1938 from Rush Medical College of the University of Chicago, and his M.P.H. in 1944 from John Hopkins University. He has served for 8 years in the Commissioned Corps of the U. S. Public Health Service, reaching the rank of Surgeon before being released from active duty to accept his present position. During the war he spent 14 months in the Caribbean area, serving as Public Health Service Venereal Disease consultant in the American possessions. He was a consultant, clinic director, and instructor at the School of Tropical Medicine, San Juan, Puerto Rico, and did surveys in International health for the Anglo-American Caribbean Commission, visiting British Guiana, Jamaica, and the British West Indies. For 18 months Dr. Porterfield has been Chief of the Division of Venereal Disease Control in the Ohio Depart-

ment of Health, but since March, 1947, has been attached to the Research Grants Division, National Institute of Health, Bethesda, Md., working in connection with grants-in-aid for medical research. Dr. Porterfield succeeds Roger E. Heering, M.D., M.P.H., who has resigned to enter private practice.

#### LEGION OF MERIT AWARDED TO DR. LARIMORE

The War Department has announced that the Legion of Merit has been awarded to Captain Granville W. Larimore, M.C., A.U.S., of New York City, presently the Director of Health Education in the American Cancer Society. According to the citation, Dr. Larimore, while serving in various capacities in the preventive medicine service, Office of the Surgeon General, performed notably outstanding service. As Chief of the Education Branch, Venereal Disease Control Division, he was a key figure in promoting a complete Army-wide venereal disease education program. Also as Chief of the Health Education Unit his responsibilities were extended to all health education matters in the field of preventive medicine. Dr. Larimore is a graduate of Rush Medical College, University of Chicago, in 1936. He holds an M.P.H. degree from the Harvard School of Public Health.

#### MERCK AWARDS FOR TRAINING SCIENTISTS

Late in May, the National Research Council announced 5 awards to provide promising young scientists with further research training in the closely allied fields of chemistry and biology. The research will be carried on in various biochemical subjects at the California Institute of Technology, Rockefeller Institute for Medical Research, the Universities of Wisconsin and Rochester, and the Naples, Italy, Zoological Station.

A. N. Richards, M.D., of the Uni-

versity of Pennsylvania, is Chairman of the Merck Fellowship Board of the National Research Council. Applicants may apply to this Board (2101 Constitution Avenue, Washington, D. C.) for fellowships at any time. The closing date for the academic year 1948-1949, is December 31, 1947.

#### 1947 OCCUPATIONAL DISEASE COMPENSATION LAWS

The Legal Committee of the Industrial Hygiene Foundation, whose Chairman is Theodore C. Waters, has prepared an analysis of the new occupational disease compensation laws enacted in 5 states at the 1947 sessions of their legislatures. It also summarizes the amendment to the New York Occupational Disease Law and reports the appointment of legislative commissions to study such legislation in Vermont and Montana.

This analysis is available, apparently without charge, from the Industrial Hygiene Foundation, 4400 Fifth Avenue, Pittsburgh 13, Pa.

#### RHEUMATIC HEART DISEASE TO BE STUDIED IN NEW YORK

The New York University College of Medicine in cooperation with the New York City Health Department will study the crippling effects of rheumatic fever and rheumatic heart disease among school children. The study will be made in the Lower East Side District where a preliminary study was made in 1946. Of nearly 1200 eighth grade children examined at that time, more than 3 per cent were found to have existing or potential heart disease. In all of New York City, it is estimated that 7,000 school children have rheumatic fever.

The study will be directed by Elvira DeLee, M.D., of the Department of Preventive Medicine of the New York University. It is supported by the New York Heart Association and the U. S.

Public Health Service, and will have the coöperation of the New York City Department of Education, the New York School of Social Work, the Metropolitan Life Insurance Company, the Rheumatic Fever Council of the American Heart Association, and the U. S. Children's Bureau.

#### AMERICAN HEART ASSOCIATION ELECTION

At the annual meeting of the American Heart Association in Atlantic City, June 6-7, Dr. Arlie R. Barnes, was elected President and Dr. Tinsley R. Harrison, President-Elect. Other officers are Dr. Carl J. Wiggers, Vice-President, Dr. Harry E. Ungerleider, Secretary, and Samuel Harrell, Treasurer. Thomas I. Parkinson, President of the Equitable Life Assurance Society of the United States, was named Chairman of the Board of Directors.

#### KANSAS CITY HEALTH DEPARTMENT INTEREST IN PREVENTION OF HOME ACCIDENTS

Harry F. Schulte, Industrial Hygiene Engineer, Kansas City Metropolitan Area Health Department, recently gave a discussion of the toxicity of common solvents used in home dry cleaning and painting, before the Missouri Public Health Association meeting. The department is making a meritorious effort to publicize information of this character which will prevent a type of home accident that occurs frequently.

#### WHITNEY FOUNDATION TO STUDY RHEUMATIC FEVER

The Helen Hay Whitney Foundation for Rheumatic Fever Research was recently organized. It will stimulate research into the cause of rheumatic fever which is the leading fatal disease of childhood as well as the later cause of crippling heart disease. The Foundation will stimulate research through grants-in-aid to universities, hospitals, and other research institutions. Its first un-

dertaking will be a survey of resources and needs in the rheumatic fever field.

The Medical Director of the newly organized Foundation is T. Duckett Jones, M.D., who is also a director of the American Heart Association and Chairman of its Council on Rheumatic Fever. He is a member of the Advisory Committee on Crippled Children's Services of the Federal Security Agency.

Temporary headquarters of the Foundation are at New York Hospital, 525 East 68th Street, New York, N. Y.

#### INDUSTRIAL HYGIENE DIVISION IN ARKANSAS

The 1947 Arkansas State Legislature passed the Industrial Health Service Act establishing a Division of Industrial Hygiene in the State Board of Health. The act authorizes the Division to investigate places of employment, and to study the conditions which might be responsible for ill health of the industrial worker. The Board of Health will also adopt rules and regulations pertaining to the control of industrial health hazards.

#### RETIREMENT OF MARY SWAIN ROUTZAHN

Early in June the Russell Sage Foundation announced the retirement of Mrs. Mary Swain Routzahn who has been Director of the Foundation's Department of Social Work Interpretation. She began her service in the Foundation in the Department of Surveys and Exhibits 35 years ago with her husband, the late Evart G. Routzahn. She pioneered in developing many of the present-day techniques of presenting information to the public. Together also, they with others organized the Public Health Education Section of the American Public Health Association, and developed guides and study courses for students of publicity techniques. Mrs. Routzahn helped to found the National Publicity Council for Health and

Welfare Services and for many years directed its work. In 1944 the first national Elizabeth Severance Prentiss Award in Health Education was made to Mrs. Routzahn, and posthumously to Mr. Routzahn. Mrs. Routzahn will continue teaching courses in social work interpretation at the New School of Social Work, and serve as Consultant to the National Publicity Council.

#### DEATH OF DR. HILL

Hibbert Winslow Hill, M.D., D.P.H., died on May 23 at the home of his son in Hackensack, Minn. For half a century a public health worker in both Canada and the United States, Dr. Hill was a pioneer in the development of public health as concerned with the individual and not merely with the physical environment. His *New Public Health*, *The New Hygiene*, and *Sanitation for Public Health Nurses* all expressed his deep sense of the obligation of the profession to the public, and his keen critical evaluation of existing public health methods. He was the first bacteriologist to serve in a full-time capacity in Canada and he was the first official epidemiologist in the United States.

Retired since 1934 because of ill health, he had previously been Professor of Bacteriology in the University of British Columbia, Director of the Institute of Public Health in London, Ontario, and Executive Secretary of the Minnesota Public Health Association. Between 1905 and 1912 he was with the Minnesota State Board of Health, first as Assistant Director of Laboratories and Assistant Professor of Bacteriology in the University of Minnesota, and later as Director of the Division of Epidemiology.

#### BRITISH HEALTH CONGRESS

At the latest Health Congress convened by the Royal Sanitary Institute in Torquay, England, June 2-6, 1947

government departments, local authorities, and scientific bodies were represented. Among the American representatives were Harry S. Mustard, M.D., President of the A.P.H.A., and Martha M. Eliot, M.D., of the U. S. Children's Bureau and President-elect of the Association.

According to *The Medical Officer*, "uncertainty and anxiety about the future under the National Health Service Act was reflected throughout the discussions . . . particularly the problem of the future career of the district M.O.H."

Sir Andrew Davidson, Chief Medical Officer, Department of Health for Scotland, ended his presidential address with "The grim experience of the past few years and the potentialities of modern scientific discoveries for good and for evil alike, bring home urgently and acutely the fact that the destiny of mankind depends upon the benign attributes of the human mind and heart. Few are so favourably placed to guide that destiny as those concerned with the preservation of the health of the world's peoples."

#### IN-SERVICE TRAINING IN ACTION

"What's New in Public Health," a series of 12 lectures for public health workers in the North Metropolitan District of the Massachusetts Department of Public Health, was held in the spring of 1947.

Realizing that during the war years due to heavy work schedules and other restrictions, it had been difficult for workers to keep pace with the many new developments, Dr. A. Daniel Rubenstein, Health Officer of the North Metropolitan District, planned the lectures. Expenses of the course were assumed by the Middlesex Health Association, and Harvard School of Public Health provided the facilities.

Members of the Harvard School of Public Health faculty, staff of the Massachusetts Department of Public

Health, and national public health experts gave the various lectures. Sixty-seven public health workers including board of health, school, and industrial nurses; board of health agents; and health educators attended the sessions.

#### "EYE-BANK" FOR BOSTON

The Eye-Bank for Sight Restoration (national headquarters, 210 East 64th Street, New York, N. Y.) celebrated its second anniversary in May by establishing an affiliated eye-bank in Boston, prepared to serve the needs of New England. Seven hospitals in the Boston area and one in Maine have already become affiliated with it. In 1946 the first anniversary was marked by the announcement of an eye-bank in Chicago to serve the Midwestern area.

The parent association and its affiliates collect and preserve healthy corneal tissue from human eyes for transplanting to blind persons who have lost their sight because of corneal defects. The demand for eyes still exceeds the supply. Among the activities of the eye-bank is public education to urge persons to donate their eyes for use after death.

#### LINCOLN AND LANCASTER COUNTY, NEBRASKA, JOIN FORCES

By authorization of the 1947 Nebraska legislature, the Lincoln City Health Department was recently extended to include all of Lancaster County, thus forming a consolidated city-county unit.

The Health Officer of this city-county unit is Corinne S. Eddy, M.D. She has had previous public health experience in both Alabama and Mississippi.

#### CHARLESTON AND KANAWHA COUNTY HEALTH DEPARTMENTS MERGE

On July 1, the largest county in West Virginia, Kanawha, consolidated with its chief city, Charleston, which is also the state capital, to form a city-county health unit. The consolidation of the

two agencies had long since been advocated by the U. S. Public Health Service and the State Department of Health, and represents the successful culmination of a drive by many agencies to combine the overlapping city and county health work. The city council of Charleston and the county court have each appropriated \$32,000 for the operating expenses for the new fiscal year. This represents an initial per capiti appropriation of about 33 cents from local funds.

The director of the new city-county unit had not been appointed at the end of July.

#### TWO NEW BUREAUS CREATED BY WEST VIRGINIA PUBLIC HEALTH COUNCIL

At a recent meeting the West Virginia Public Health Council, upon recommendation of the State Health Commissioner, created a Bureau of Mental Health which is being financed by funds available through the National Mental Health Act recently passed by Congress and matching state funds. W. B. Rossmann, M.D., Charleston, will head the Bureau of Mental Health.

The passage in the 1947 Legislature of a hospital licensing bill led also to the creation of a Bureau of Hospital and Medical Care. Inasmuch as the licensing act becomes effective July 1, 1948, this Bureau will not be put in operation until that time.

#### INDUSTRIAL HYGIENE IN HIGH SCHOOL

High school students in Portland, Ore., will learn the meaning of industrial hygiene and how it is practiced, especially in Portland industries. The superintendent of schools has announced that the unit will be taught as a part of the health course of study. This is the first time that industrial hygiene has been an integral part of such a high school course.

The lessons are designed to acquaint students with the health hazards they

may meet in future jobs, the physiological effects of the hazards, and the preventive measures which may be employed. Emphasis is placed on the necessary cooperation of the workers to prevent occupational disability.

Authors of the plan are health education specialists, high school health teachers, and members of the Division of Industrial Hygiene, Oregon State

in Chicago, May 19. The Borden award for 1947 was presented to Leonard A. Maynard, Ph.D., Ithaca, N. Y., for contributions to the physiology of milk secretion, factors affecting milk production and milk composition, and the requirements of animals for dietary fats. The Mead Johnson and Company award for research on the vitamin B complex was presented to Dr. William J. Darby, Associate Professor of Biochemistry, Vanderbilt University School of Medicine, Nashville, Tenn., Paul L. Day, D., Professor of Physiologic Chemistry, University of Arkansas School of Medicine, Little Rock, and E. L. Robertstad, Ph.D., Research Chemist, Merle Laboratories, Pearl River, N. Y., for their investigations on B complex vitamins with special reference to studies in the chemistry and nutritional significance of folic acid.

c.1

V.37

~~XXXXXXXXXXXXXXXXXXXX~~

~~XXXXXXXXXXXX~~

American Journal of Public Health  
Jan-Dec, 1947

**COURSE IN INDUSTRIAL HYGIENE**  
GEORGIA SCHOOL OF TECHNOLOGY  
The division of graduate studies of Georgia School of Technology has just completed an 11 week course in industrial hygiene for engineers. It was designed to provide a comprehensive background for men with collateral scientific or engineering training who are interested in work in industrial hygiene.

The need for personnel in industry as well as governmental work prompted arrangements for this intensive one-quarter course at graduate level.

**MARYLAND DIVISION OF CANCER CONTROL**  
A Division of Cancer Control has been created in the Bureau of Medical Services of the Maryland State Department of Health. Dr. W. Ross Cameron, Baltimore, Assistant Director of Welfare for Medical Care, and Dr. Howard W. Jones, Jr., Baltimore, Maryland, Division of the American Cancer Society, will assume joint responsibility for the development of a program including

Charles A. Janeway of Boston, Chairman of the Red Cross Advisory Committee on Blood and Blood Derivatives.

#### NUTRITION AWARDS

The American Institute of Nutrition made two awards at its annual dinner

statistical studies, educational activities, and the organization of adequate preventive diagnostic and treatment facilities.

#### OFFICE OF RECRUITMENT AND TRAINING IN CALIFORNIA

An Office of Recruitment and Training, with George T. Palmer, Dr. P.H., as coördinator, has been established in the California State Department of Public Health, San Francisco. The new unit will serve to coördinate the department's activities in this field. Dr. Palmer, who will be assisted in the administration of the office by an advisory board consisting of various staff members, has recently served as Senior Sanitarian, (R), U.S. Public Health Service, preceding which he was Associate Field Director of the American Public Health Association.

#### PROPOSAL TO PROVIDE GRANTS FOR POSTGRADUATE SCHOOLS OF PUBLIC HEALTH

Senator Robert A. Taft of Ohio, on June 17, introduced into the Senate of the United States a bill "to amend the Public Health Service Act to provide grants to postgraduate schools of public health." This bill would provide a sum to enable the Surgeon General to assist in improving the training available in the field of public health. The funds are to be used for the establishment and maintenance of teaching staffs, maintenance and operation of facilities, and scholarships for persons contemplating work in the field of public health. An additional appropriation is provided for the construction of buildings and other facilities, if necessary.

The appropriation for the operation of schools would be available on the basis of enrollment. The bill also provides that grants could be made only to those postgraduate schools of public health that are accredited by a board approved by the Surgeon General.

The bill was referred to the Committee on Labor and Public Welfare but no action was taken on it during the 80th Congress.

#### ENRICHMENT OF CORN PRODUCTS

The Food and Nutrition Board of the National Research Council at a meeting in May, 1947, adopted the following resolution with regard to the enrichment of corn products:

That universal enrichment of all corn products should be achieved as promptly as possible, especially in all areas of the United States where the average annual per capita consumption of corn products equals or exceeds fifty pounds;

That all states in such areas should adopt the federal standards for purposes of legislation concerning the enrichment of corn products;

That state and federal authorities should take immediate steps to foster the enrichment of all whole corn products produced within the borders of each such state;

That mandatory legislation requiring the enrichment of both whole and degerminated corn products should be enacted and enforced as soon as practicable in each such state.

The Board further directs that a copy of this resolution be sent to the Surgeon General of the U. S. Public Health Service and the Director of the U. S. Agricultural Extension Service for transmission to their officers and agents in the Southern States; to the presidents of the agricultural colleges of the South, to the commissioner of health of each Southern State, to the American Public Health Association, and to the Council on Foods and Nutrition of the American Medical Association.

Corn was first included as a cereal to be considered for enrichment by the Board in 1941 as a measure for the prevention of pellagra and other nutritional deficiencies in areas of high corn consumption. Such enrichment was endorsed as early as 1943 and a tentative partial enrichment formula proposed. Finally, early in 1946, it recommended nutrient levels in corn products corresponding substantially to those in effect for enriched flour. The issuance by the Federal Food Administration in

1947 of definitions and standards for enriched corn products gave further impetus to the promulgation of the Food and Nutrition Board's most recent resolution.

In order to develop plans for corn enrichment, the Board held a two day conference in mid-July at Clemson A & M College, Clemson, S. C. Here were discussed the most effective procedures for developing the enrichment program as well as the educational problems and techniques for establishing better public understanding of the need for enrichment. Clemson College for the past 3 years has demonstrated the feasibility of enrichment of whole corn meal in small mills and has led in developing suitable cheap machinery and usable enriching mixtures. Representatives were present at this conference from the 13 states from West Virginia to Oklahoma where the consumption of corn products is extensive enough to have public health significance.

#### NEW OFFICERS OF TWO AFFILIATED SOCIETIES OF A.P.H.A.

##### *Arizona Public Health Association—*

*President—Margaret J. Maleady, R.N., Bisbee*

*President-Elect, O. V. Cooper, Phoenix*

*Vice-President, Clerks' Section—Eunice Ross, Bisbee*

*Vice-President, Health Officers Section—Paul W. McCracken, M.D., Phoenix*

*Vice-President, Laboratory Section—Mr. Bayless, Bisbee*

*Vice-President, Nurses' Section—Marjorie Fairley, Wilcox*

*Vice-President, Sanitarians' Section—Oscar V. Cooper, Phoenix*

*Secretary-Treasurer—Jefferson I. Brown, R.N., Phoenix*

##### *Utah Public Health Association—*

*President—LaVerna Peterson, Ogden*

*President-Elect—Frederic M. Kriete, M.D., Salt Lake City*

*Vice-President—James Z. Davis, M.D., Salt Lake City*

*Treasurer—Verle B. Lesnan, R.N., Salt Lake City*

*Secretary—Louis P. Gebhardt, M.D., Salt Lake City*

#### WEST VIRGINIA PUBLIC HEALTH ASSOCIATION

At a recent meeting of the West Virginia Public Health Association, the following officers were elected for the year 1947-48:

*President—L. A. Dickerson, M.D., Health Officer, Madison.*

*1st Vice-President—L. A. Lively, Sanitarian, Bluefield.*

*2nd Vice-President—Charlotte McLoughlin, Public Health Nurse, Kanawha County Health Department.*

*Secretary-Treasurer—Annette King, State Health Department.*

#### HAWAII PUBLIC HEALTH ASSOCIATION

The Hawaii Public Health Association elects new officers:

*President—Virginia Jones.*

*Vice President—Robert Horton, M.D.*

*Secretary—Katherine Walter.*

*Treasurer—Andrew Wong.*

C. L. Wilbar, Jr., M.D., President of the Board of Health, was elected to the executive committee, with Virginia Doyle and Robert Lloyd.

#### CANCER INSTITUTE FOR PUBLIC HEALTH NURSES

The Ohio Division of the American Cancer Society, with the coöperation of the Ohio State Department of Health and the Western Reserve University School of Nursing, in June held a three day Cancer Institute for Public Health Nurses at the Cleveland Health Museum. Called on a state-wide basis, the Institute was designed to give public health nurses in the state a background of information and interest for sharing in the cancer control program.

#### VIRGINIA EXTENDS LOCAL HEALTH SERVICE

Announcement has been made by the Virginia Health Department of the addition of Surry County to the already existing tri-county health unit including Dinwiddie, Prince George, and Sussex Counties. The combined population of the four counties, without the inde-



pendent cities of Hopewell and Petersburg, which have their own health departments, is about 50,000. The Health Officer is Francis J. Clements, M.D.

Also reported by Virginia are the appointment of Walter R. Johnson, M.D., and Merle V. Bemis, M.D., respectively, as Health Officers of the Alleghany-Botetourt and Buchanan-Tazewell bi-county health units. Both of these districts have been without health officers for a number of months.

#### INDUSTRIAL HEALTH CONSULTANT SERVICE

Gordon C. Harrold, Ph.D., and Stuart F. Meek, M.D., formerly Chief Industrial Hygienist and Assistant Medical Director respectively for the Chrysler Corporation, and more recently independent consultants, with a group of associates have organized a confidential consultant service in the broad fields of industrial health, hygiene, and safety for individual clients.

Their organization is called the Industrial Health, Hygiene and Safety Service. Its headquarters are at 18221 Muirland Avenue, Detroit, Mich.

#### DRS. LANZA AND MELENEY DIRECT INSTITUTE OF INDUSTRIAL AND SOCIAL MEDICINE

Among the plans announced for the new fifteen and a half million dollar New York University-Bellevue Medical Center in New York City are plans for an Institute of Industrial and Social Medicine. According to an announcement by the University, the co-directors of the Institute will be Anthony J. Lanza, M.D., recently Associate Medical Director of the Metropolitan Life Insurance Company and formerly Colonel in the U. S. Army Medical Corps, and Henry E. Meleney, M.D., Professor of Preventive Medicine at New York University. In announcing the plan Dean Currier McEwen of New York Univer-

sity Medical School reported that this project would cost \$1,575,000 for laboratories, clinical facilities and administration. Among its features will be a general clinic to be opened in the fall of 1947 to offer wage earners a comprehensive plan of medical care. Dr. Lanza estimates that the annual loss to the nation in wages and medical expenses because of absences from work occasioned by illness approaches eight billion dollars.

#### GRANT FOR MULTIPLE SCLEROSIS RESEARCH

The Association for the Advancement of Research on Multiple Sclerosis has made its first grant, of \$64,350, for specialized research on multiple sclerosis. For a three year period, it will cover research in the field of allergy in relation to the disease. The research will be under the direction of Elvin A. Kabat, M.D., Assistant Professor of Bacteriology at Columbia University, and known for his research in specialized fields of medicine. His work will be done largely at the Columbia University College of Physicians and Surgeons and the Neurological Institute of New York.

#### BRUCELLOSIS CENTER ESTABLISHED AT FINLAY INSTITUTE

On March 10, 1947, the Finlay Institute, Havana, Cuba, established a new service to cover general investigation and the bacteriological quality of milk and the specific study of brucellosis. At the recent inauguration ceremonies, particular credit was given to Dr. Ramón Grau San Martín, President of Cuba and Dr. José R. Andreu, Minister of Health and Social Assistance, for their special interest and help in securing the establishment of these new activities.

#### MAINE'S NEW SECTION OF INDUSTRIAL HEALTH

A section of Industrial Health was established in the Maine Bureau of

Health in January. Its director is J. Elliot Hale who, in 1938, made a survey of the industrial health problem in the state. It was then found that many unsatisfactory working conditions existed. Consequently a program was planned of engineering, statistical, and educational services to Maine industries. Mr. Hale has been for many years Senior Sanitary Engineer in Maine's Division of Sanitary Engineering.

## PERSONALS

### Central States

LEROY L. FATHERREE, M.D., M.P.H.\* Health Officer of Omaha, Neb., has been designated officially by Douglas County as County Health Officer. Dr. Fatherree will serve as Health Officer for the combined area.

THOMAS A. GARDNER, M.D., Assistant Public Health Director of the city of Springfield, Ohio, since last October, was appointed Director of Health recently.

FRANK H. JENNE, has been named Assistant Secretary of the Cincinnati, Ohio, Public Health Federation and will take up his duties on September 15. Mr. Jenne received his Master of Health degree from the University of Michigan in June, and will complete field training at the Training Center, Savannah-Chatham Health Department, Savannah, Ga., in September before taking up his position with the Federation.

JOHN F. SHRONTZ, M.D.,† on April 1 began his duties as Medical Director of General Mills, Inc., Minneapolis, Minn. He had previously been Chief of the Division of Industrial Hygiene of the Illinois State Health Department, and is one of the authors of the *Medical Survey Report* of the bituminous coal mining industry recently published.

\* Fellow, A.P.H.A.  
† Member, A.P.H.A.

CORA M. TEMPLETON, R.N.,\* Director of Public Health Nurses, Cleveland Health Department, retired as of June 30, after 34 years of service, 27 of them as director. CARRIE E. LEWIS, R.N.,† Assistant Director of Nurses in Tuberculosis Control since 1929, has been appointed Acting Director of Nurses.

PERCY T. WATSON, M.D., M.P.H.† formerly Director of Public Health District No. 1 with headquarters in Bemidji, Minn. was awarded the honorary degree of Doctor of Science by Carleton College, Northfield, Minn., at its commencement program, June 9, for his many contributions to international good will and human betterment. Dr. Watson was appointed Director of the Minneapolis Division of Local Health Services, effective July 1.

### Eastern States

STANHOPE BAYNE-JONES, M.D.,\* recently Dean at the Yale University School of Medicine, New Haven, Conn., and recently Director, Board of Scientific Advisors, Jane Coffin Childs Memorial Fund for Medical Research, has been appointed President of the Joint Administrative Board of New York Hospital, Cornell Medical Center, New York, N. Y., effective July 1 with offices at 525 East 68th Street.

LEVERETT D. BRISTOL, M.D., Dr.P.H.,\* has resigned as Commissioner, Maine State Department of Health and Welfare, in which position he has served for the last 2 years. Thirty years ago he became Maine's first Commissioner of Health, before the State Departments of Health and Welfare were combined. For many years, he was active in New York City as Director of the Bellevue-Yorkville Health Demonstration, and as Health Director of the American Telephone and Telegraph Company. He is a past

president of the Public Health Association of New York City, and of the New Jersey Health and Sanitary Association.

JAMES E. BRYAN,<sup>†</sup> has resigned as Executive Secretary of the Medical Society of the County of New York, and Managing Editor of *New York Medicine* on September 1, to become Executive Officer of the Medical Society of New Jersey with headquarters in Trenton.

MONROE DAVIS EASTON, M.D., became Associate Professor of Bacteriology and Immunology in the Harvard Medical School on July 1. He had previously served 3 years in this department, and also as instructor in the Yale and Washington University Schools of Medicine. Since 1937 he had been a member of the staff of the International Health Division of the Rockefeller Foundation and Director of the Research Laboratory of the California State Department of Public Health.

JOHN EDWARD FARRELL,\* Executive Secretary of the Rhode Island Medical Society and the Providence Medical Association was granted an honorary degree of Sc.D. at the June Commencement exercises of Providence College.

FRANK ROBERT FRECKLETON, M.D., M.P.H.,<sup>†</sup> who has recently finished his course in the Columbia University School of Public Health, has been appointed to the staff of the Rensselaer County Department of Health, Troy, N. Y.

DON M. GRISWOLD, M.D.,\* District State Health Officer in charge of the Geneva District, retired May 31, completing 16 years of service on the staff of the New York State Department of Health. Dr. Griswold is author of a textbook *Outline of*

*Epidemiology* developed for use in teaching medical students and health officers. He is also author of many scientific papers on such subjects as epidemiology, public health administration, administrative control of tuberculosis, the control of typhoid carriers, control of measles, and whooping cough, and communicable diseases in the tropics.

LOWELL IBERG has been named Associate Director of the New York State Charities Aid Association. He has been with the Association since 1940, except for leaves to work with UNRRA and with the New York State Committee on Child Care.

L. E. KLING, M.D.,<sup>†</sup> who on July 1 completed 6 years service with the U. S. Public Health Service, was appointed Acting Medical Director of the Planned Parenthood Federation of America with headquarters in New York, N. Y.

RUSSELL H. KURTZ, Editor of the *Social Work Year Book* published by the Russell Sage Foundation, New York, N. Y., has resigned to become Executive Director of the New Hampshire Citizens Council for the General Welfare with offices in Concord, N. H.

W. C. SPRING, M.D., M.P.H.,<sup>†</sup> who recently completed his public health course at Columbia University School of Public Health, has been appointed Commissioner of Health of the newly-established Tompkins County Department of Health, Ithaca, N. Y., effective July 1.

#### Southern States.

CAROLINE H. CALLISON, M.D.,<sup>†</sup> former Health Officer for Greenwood and McCormick Counties, South Carolina, has returned to the State Board of Health after receiving her Master of Public Health degree from Columbia University, New York, N. Y., and has been assigned to the Charleston County Health Department.

\* Fellow, A.P.H.A.

<sup>†</sup> Member, A.P.H.A.

BERNARD D. DAITZ,\* formerly Major, Sanitary Corps., Medical Rehabilitation Service, Veterans' Administration Hospital, Oteen, N. C., has been appointed Assistant Executive Officer, Medical Rehabilitation Service, Department of Medicine and Surgery, Central Office, Veterans' Administration, Washington, D. C.

HARRY EAGLE, M.D., has been appointed Scientific Director of the National Cancer Institute and will be in charge of research. He has been with the U. S. Public Health Service since 1936 assigned to research activities at the Johns Hopkins School of Hygiene and Public Health. He is noted for research on an improved method of treating syphilis, and for work on the cause and cure of sleeping sickness.

CLARA C. JOEL FLEISCHER, M.D., has been named Director of Maternal and Child Health of the City Department of Health of Richmond, Va., a newly created post. She will develop a city-wide program of maternal, infant and preschool health.

T. PAUL HANEY, JR., M.D.,\* on July 1 took office as Director of Maternal and Child Health of the Florida State Health Department. For the past 7 years he has been Health Officer of Jones County, Mississippi.

J. W. MOUNTIN, M.D.,\* has been appointed Associate Chief, Bureau of State Services, U. S. Public Health Service. He was formerly Chief of the States Relations Division of the Bureau.

DAVID E. PRICE, M.D., Dr.P.H.,† who is a staff member of the Public Health Service serving with the Research Grants Division of the National Institute of Health, has been transferred to a related activity of the National Cancer Institute, Bethesda, Md., and is now in charge of the Research and Educational Grants Program of the Cancer Institute.

R. G. ROSS, M.D., was named Supervisor of the milk control program for the Oklahoma State Department of Health on June 16.

DANIEL H. ROWE, M.D., has been appointed Health Officer of the Administration Health Unit composed of DeSoto, Charlotte and Hardee Counties with headquarters at Arcadia, Fla.

R. L. SIMMONS, M.D., M.P.H.,† has resigned as Director of the Lauderdale County Health Department, Meridian, Miss., to accept a position as Head of the Department of Preventive Medicine and Public Health at the University of Louisiana School of Medicine, New Orleans, effective August 1.

ALFRED H. WIETERS,\* formerly Senior Sanitary Engineer, U. S. P. H. S., Washington, has returned to his former position as Director of Public Health Engineering, Iowa State Department of Health, Des Moines, Iowa, effective July 1.

HAROLD M. WILLIAMS, M.D.,† formerly Director of the Department of Public Health and Welfare of Fort Worth, has accepted appointment as Assistant Secretary-Editor of the State Medical Association of Texas, Fort Worth.

#### Western States

MILDRED E. DOSTER, M.D.,† on September 1 began her new duties as local health officer of the Washington City-County, Iowa, Health Department, and director of one of the state health districts comprising 7 of the counties of Iowa. Dr. Doster was formerly Director of School Health Service in the Denver, Colo., public schools.

GORDON C. EDWARDS, M.D., has been named Director, Division of County Health Units, of the Oregon State Board of Health. He succeeds RICHARD H. WILCOX, M.D., who recently resigned to return to his former post

of Umatilla County Health Officer. The new County Health Units Director has been for the last year Director of the Venereal Disease Control Section, and will continue to supervise the activities of this Section until a new Venereal Disease Control Officer can be named.

ROY O. GILBERT, M.D.,† formerly Assistant Health Officer and Director, Bureau of Preventable Diseases, Los Angeles County Health Department, has been appointed Health Officer of the County, effective May 6.

EDWARD KUPKA, M.D.,† returns to the position of Chief, Tuberculosis Service, California State Health Department. He left in 1944 to become Medical Director of La Vina Sanatorium, serving as consultant to the department in the meantime.

WALTER B. QUISENBERRY,\* former acting head of the Department of Public Health and Preventive Medicine at the College of Medical Evangelists in Loma Linda, Calif., was recently appointed Chief of the Bureau of Venereal Diseases for the Territorial Board of Health, Hawaii.

RUTH J. RAATTAMA, M.D., M.P.H.,\* who for several years has been Director of the Division of Maternal and Child Health in the Idaho State Department of Health, Boise, has resigned effective July 1.

### Death

STEPHEN A. KOWALCHIK, Principal Sanitary Engineer, New Jersey State Department of Health, died June 18. He joined the engineering staff of the Department in 1930.

### CONFERENCES AND DATES

American Association for the Advancement of Science, Chicago, Ill. December 26-31.  
American College of Hospital Administrators. St. Louis, Mo. September 21-22.

American Dietetic Association. Philadelphia, Pa. October 13-17.

American Hospital Association. Annual Convention. St. Louis, Mo. September 22-25.

American Public Health Association—75th Annual Meeting. Atlantic City, N. J., October 6-10.

American Public Works Association. Jacksonville, Fla. October 5-8.

American Water Works Association:

Four States Section. Washington, D. C. November 19-21.

Iowa Section. Cedar Rapids, Iowa. October 9-11.

Joint Meeting—Florida and Cuban Sections. St. Petersburg, Fla. November 20-22.

Kentucky-Tennessee Section. Louisville, Ky. September 22-24.

Michigan Section. Bay City, Mich. September 18-20.

New Jersey Section. Atlantic City, N. J. November 6-8.

North Carolina Section. Greensboro, N. C. November 10-12.

Ohio Section. Columbus, Ohio. September 30-October 1.

Rocky Mountain Section. Cosmopolitan Hotel, Denver, Colo. September 25-26.

Southeastern Section. Atlanta, Ga. November 3-5.

Southwest Section. Amarillo, Tex. October 13-15.

Virginia Section. Roanoke, Va. November 17-18.

West Virginia Section. Bluefield, W. Va. October 2-3.

Wisconsin Section. Hotel Schroeder, Milwaukee, Wis. October 23-25.

Civil Service Assembly. Dallas, Tex. November 17-20.

Florida Public Health Association. Tampa, Fla. October 23-25.

Georgia Water and Sewage Association. Georgia School of Technology. Atlanta, Ga. September 17-19.

International City Managers' Association. Coronado, Calif. October 5-9.

International College of Surgeons—12th Annual Assembly and Convocation of the United States Chapter. Palmer House, Chicago, Ill. September 28-October 4.

Michigan Public Health Association. Detroit, Mich. November 5-7.

National Association of Housing Officials. New York, N. Y. November 17-20.

National Committee for Mental Hygiene, Inc. Hotel Pennsylvania, New York, N. Y. November 12-13.

\* Fellow, A.P.H.A.

† Member, A.P.H.A.

# American Journal of Public Health and THE NATION'S HEALTH

---

Volume 37

October, 1947

Number 10

## A Future for Industrial Medicine\*

LEONARD J. GOLDWATER, M.D., F.A.P.H.A.

*Professor of Industrial Hygiene, Columbia University, School of Public Health,  
New York, N. Y.*

INDUSTRIAL medicine is in a state of flux. It appears to be approaching maturity, but as yet the ultimate pattern has not become fixed. Physicians, employers, and workers all have a stake in the future of industrial medicine, and all three, especially through their respective organized bodies, will play a part in determining the shape of things to come. At the present moment medicine and its allied professions are in a position to assume leadership in this field. If this is to be done it will be necessary to dispel some of the confusion which now exists and to have a clear idea of the objectives of industrial medicine as well as the methods of attaining these objectives.

### SCOPE AND OBJECTIVES

Up to the present time, no satisfactory and generally accepted definition of industrial medicine has been proposed, although a number of authoritative organizations and individuals have stated what they consider to be its scope and objectives. The Council on Industrial Health of the American Medical Association, in a detailed state-

ment published in 1940<sup>1</sup> states that "Industrial health is an inclusive term, incorporating three major types of activity.

"1. Medical and surgical care to accomplish prompt restoration to health and earning capacity following industrial accident or disease.

"2. Prevention of disease or injury in industry by the establishment of proper control over industrial environment.

"3. Education of employees about healthful living, both in and out of the industrial environment."

In another part of the same statement the Council defines the scope of medical service to be provided by the medical department of an industry in the following terms:

"1. Regular appraisal of plant sanitation.

"2. Periodic inspection for occupational disease hazards.

"3. Adoption and maintenance of adequate control measures.

"4. Provision of first aid and emergency services.

"5. Prompt and early treatment for all illnesses resulting from occupational exposure.

"6. Reference to the family physician of individuals with conditions needing attention, coöperating with the patient and physician in every practical way to remedy the condition.

\* Special Review Article prepared at the request of the Editorial Board.

"7. Uniform recording of absenteeism due to all types of disability.

"8. Impartial health appraisals of all workers.

"9. Provision of rehabilitation services within industry.

"10. The conduct of a beneficial health education program."

More recently the Council on Industrial Health has offered the following definition<sup>2</sup>: "Occupational Medicine deals with the restoration and conservation of health in relation to work, the working environment and maximum efficiency. It involves prevention, recognition and treatment of occupational disabilities and requires the application of special techniques in the fields of rehabilitation, environmental hygiene, toxicology, sanitation and human relations."

The American College of Surgeons in a recent publication<sup>3</sup> states that "The purpose of Industrial Medicine has been and always will be fundamentally the same, namely, 'the adequate care of the health of the industrial worker.'" In amplification of this statement four basic objectives of industrial medicine are given:

"1. To ascertain, by examination, the physical and mental fitness of employees for work.

"2. To maintain and improve the health and efficiency of those already employed.

"3. To educate the worker in accident prevention and personal hygiene.

"4. To reduce lost time and absenteeism from illness or injury."

The concepts quoted above may be regarded as representing those of "organized medicine." There appears to be one important fundamental difference between the point of view of the American Medical Association and that of the American College of Surgeons. The former strictly limits the concern of occupational medicine to disabilities arising out of work while the latter appears to believe that industrial medicine is concerned with all of the health

problems of the worker, regardless of their origin.

It is interesting to note that Dr. Stanley J. Seeger, Chairman of the Council on Industrial Health of the American Medical Association, issued a statement in 1942<sup>4</sup> which places him in agreement with the American College of Surgeons and at variance with his own council. Dr. Seeger outlines the objectives of industrial medicine as being, among other things, "to procure and maintain fitness for work through efforts applied to the worker as an individual" and "to reduce all loss of time, absenteeism, and short work spans in industry the cause of which may be *in any way* (italics ours) related to health." This concept has been carried a little further by another outstanding industrial physician, Dr. Dan Lynch, who says<sup>5</sup>: "I recommend that industry generously and for profit arrange adequate medical care for the sick as well as the injured before compelled to do it, with coöperation by organized medicine, without it, if necessary." Dr. Lynch is one of the few industrial physicians who have openly advocated complete medical care as a part of industrial medicine.

The Chamber of Commerce of the United States and the National Association of Manufacturers may be cited as examples of employer groups which have shown active interest in industrial medicine. Both of these organizations have accepted the ideas of the Council on Industrial Health of the American Medical Association in regard to the scope and objectives of industrial medicine and both have been actively engaged in stimulating the establishment of medical services in industry.

A number of individual employers have extended their industrial medical services to include general medical care for their employees, and in some instances for the families of the employees as well. The medical services provided

may be comprehensive or limited and the costs are usually defrayed in part by the employees on a prepayment basis. The more important plans of this type have been summarized by Stern.<sup>6</sup>

Activities on the part of organized labor during the past few years have been responsible for the introduction of an entirely new idea into the field of industrial medicine, namely, the inclusion of various types of health and welfare clauses in labor-management agreements. As a result, the union contract has become an important factor in industrial health since it may include provisions for such things as medical care, hospital expenses, and cash benefits in the case of illness. Many of the agreements between management and labor which provide for medical benefits originated during World War II when wages were frozen and the government permitted medical benefits to be granted by employers in lieu of wage increases. Now there is a tendency on the part of labor to attempt to preserve these agreements. Since the availability of medical care and the payment of cash benefits in the event of sickness have a distinct effect on the duration of illness and on the duration of absence due to illness, health and welfare clauses in union contracts must be regarded as falling within the field of industrial medicine. What influences, if any, the Taft-Hartley Bill will have on this type of activity remains to be seen.

Passing mention must be made of the role of government in industrial medicine. Most important is the enactment and administration of workmen's compensation laws. At the present time all states except one have enacted workmen's compensation laws. A second important function of governmental agencies is the provision of certain preventive services, that branch of industrial medicine known as industrial hygiene. Activities in this field have been greatly expanded during the past

ten years due largely to federal grants-in-aid made available to the states under the Social Security Act of 1935.

In summary, it may be said that the principal objective of industrial medicine is optimum health for all employed persons. This being the case, the scope of industrial medicine must be sufficiently broad to permit the attainment of this objective.

#### METHODS

While there is general agreement as to the objectives of industrial medicine and there are no irreconcilable differences in regard to its scope, there are wide divergences of opinion as to how the objectives are to be attained. The main issues in the controversy revolve around the functions of the various groups and individuals who are concerned with the different aspects of industrial medicine. Private practitioners, whether they be in general practice or specialists, physicians employed part time or full time in industry, certain physicians employed by governmental agencies and some employed by insurance companies and by labor unions may be mentioned among those who are involved in the practice of industrial medicine. Each one of these groups has its own set of interests and all of them must be given a voice when methods of practising industrial medicine are under discussion.

There is little doubt that the American Medical Association, as a national body and through its component state and county societies, is the most influential medical organization in the country. The great strength of the American Medical Association stems from its vast membership among private practitioners; therefore it is quite natural that in the basic philosophy of this organization the private practitioner is regarded as the key figure in any system or method of providing medical care. As applied to the practice of in-



dustrial medicine, this point of view is expressed as follows<sup>1</sup>: "The full-time industrial physician, if present trends prevail, will be less and less a therapist and more and more an administrator of public health through the application of industrial hygiene. In that capacity he should assume a public health function and act as a case finder for the private physician and specialist, through whom the direct remedial service should be applied." This statement, taken in conjunction with the list of functions of medical service in industry (quoted above), means that the American Medical Association would restrict the activities of the plant physician to little more than case finding, sanitary inspections, health education, and first aid work. This point of view, if generally adopted, might lead to a number of undesirable effects. In the first place it is unlikely that very many promising young physicians would be attracted into a field having such a limited scope. If all treatments except first aid are to be given in the offices of private physicians, an unreasonable amount of productive time would be lost while the injured, but not necessarily disabled, employee is travelling to and from the doctor's office and awaiting his turn to be treated. This would place a serious financial burden on industry and would discourage the employment of industrial physicians. Certainly few employers could be made to see the point of hiring a physician one of whose main functions would be to send employees to other physicians whenever any medical attention other than first aid is needed.

There could be other undesirable consequences if the dictates of the American Medical Association were to be followed. Not infrequently a worker who has been injured or has become ill prefers to receive treatment from the industrial physician. To oblige him to go elsewhere for treatment is to deny him the fundamental right of free choice

of physician to the same extent as this right is denied when he is obliged to accept treatment from a physician chosen by his employer (as required under the workmen's compensation laws of many states). The divided responsibility, differences in opinion, and often conflicting interests between the industrial physician and the private practitioner frequently lead to unpleasant controversy and often operate to the disadvantage of the patient. The family doctor is usually unfamiliar with working conditions in the plants where his patients are employed and tends to accept without question statements made by a patient. This may lead him incorrectly to attribute symptoms to an occupational exposure or episode or to recommend a change of duty, a period of absence, or some other unwarranted procedure. Estimation of a worker's fitness to perform a specific job or to return to work following illness or injury can best be made by the industrial physician; nevertheless he will frequently find the family physician giving conflicting advice to the patient. These are but a few of the situations in which the industrial physician and the private practitioner may be at variance.

The American College of Surgeons disagrees with the American Medical Association in regard to the treatment of industrial injuries, stating that an adequate industrial medical service requires "efficient care of all industrial injuries and occupational diseases,"<sup>2</sup> as contrasted with first aid and referral to a private physician for further treatment as stipulated by the American Medical Association. In actual practice there are few if any industrial medical departments employing a full-time physician which restrict their therapeutic activities to first aid and the treatment of occupational diseases. Workmen's compensation laws hold employers legally responsible for providing medical treatment for em-

employees who are injured or become ill in the course of their work. When a part-time or full-time industrial physician is in attendance he is ordinarily the one who renders the bulk of the treatment.

The industrial hygiene activities of physicians in the employ of an official or voluntary health agency or of an insurance company have been generally accepted as proper and as not being in conflict with practitioners of medicine. As a matter of fact there is a small number of highly trained industrial hygiene physicians who are in private practice. There are so few of these specialists that they are hardly in a position to raise a voice of protest against their main competitor, the governmental health agency. Physicians employed or retained by labor unions to render medical care to union members and their families have not been the subject of any serious controversy, at least in recent years.

It is a well known fact that, of disability among employed persons due to illness and injury, at least 90 per cent is attributed to causes not directly related to occupation. If, as the Chairman of the Council on Industrial Health of the American Medical Association has said,<sup>4</sup> one of the objectives of industrial medicine is "to reduce all loss of time, absenteeism and short work spans in industry the cause of which may be in any way related to health," it is incumbent upon the industrial physician to concern himself directly with the major cause of illness among workers, that is, the causes which are not directly related to the occupational environment. This does not necessarily mean that the physician employed by industry must undertake to render complete medical care to all employees and their families, although in certain instances this has been and is being done. It does mean, however, that methods must be found whereby divided responsibility for the

health of employed persons can be eliminated and whereby the efforts of the physician practising within the plant can be better coördinated with those of his colleagues in private practice.

#### THE CHANGING ORDER IN MEDICINE

It is apparent even to the most casual observer that the entire structure of medical practice is undergoing a number of changes. The traditional fee-for-service solo practice is no longer able to satisfy the demands of a large part of the public or of a large number of physicians. The inadequacies of the older methods have been admirably presented by the Committee on Medicine and the Changing Order of the New York Academy of Medicine.<sup>7</sup> Outstanding among the newer developments have been first, the phenomenal growth of medical prepayment plans and, second, the extension of group practice.

Efforts on the part of employed persons to secure some measure of security against the financial burdens caused by illness go back to the days of the Friendly Societies in England and later to similar organizations in this country. Employee mutual benefit associations as we know them today originated about seventy years ago<sup>8</sup> and from their early days included the payment of benefits in the event of sickness or injury. It has been estimated that at the present time there are approximately 600 mutual benefit associations in the United States covering about a million and a half employees.<sup>8</sup> A number of labor unions have established sick benefit plans, the first in this country having been set up in 1859. The number of union members covered in this way has never been large and probably will diminish as other forms of sickness insurance become more popular. At the present time there are two forms of insurance against the costs of sickness which provide coverage for substantial numbers of employed persons. These are

the Blue Cross hospital service plans which had 25,000,000 subscribers in 1946, and group health, accident, hospital, and surgical plans which cover perhaps 10,000,000 subscribers.<sup>8</sup> In both instances the subscribers represent employed persons and their dependents. The National Industrial Conference Board found in 1946 that the costs of this type of insurance were borne entirely by the employer for nearly half of the employees covered.<sup>9</sup>

According to the latest available figures, medical care plans of the service type organized for employed groups number somewhere between 100 and 150, and cover approximately 500,000 employees and 100,000 dependents.<sup>10</sup> These service plans must be distinguished from the group health plans mentioned in the last paragraph which are of the cash indemnity type. The latter offer certain cash benefits in the event of disability due to illness or injury, while the former pay part or all of the costs charged by attending physicians. In most of these plans the premium payments are defrayed jointly by employer and employee, a few being financed entirely by the employee and a smaller number entirely by the employer. The number of persons covered by some form of health insurance indicates that not only the private practice of medicine but the practice of industrial medicine as well is being affected by the rapid extension of the health insurance movement.

When the many advantages of group practice are considered it is amazing that this form of medical practice has not been developed on a larger scale. There are, of course, many types of medical practice groups, but fundamentally they all represent a form of medical teamwork functioning for the benefit of both patient and physician. Since the future of industrial medicine is inseparable from that of medicine in general, it is natural to expect group practice to

be applied to the former in at least the same degree as to the latter. The same principle applies to prepayment for medical care and to all other current developments in the practice of medicine.

#### INDUSTRIAL MEDICINE AS A SPECIALTY

Certification by a "specialty board" has become a fetish in American medicine. It cannot be denied that the motives which activated the creators of the system of certifying specialists were worthy and there is no doubt that standards of postgraduate medical education and of medical practice have in many ways been raised as a result of this movement. Nevertheless it has now begun to appear as though a Frankenstein has been created and its progenitors are showing signs of concern over what to do with this unruly monster. If the policy of giving preferential treatment in hospital appointments and salary bonuses in government jobs to possessors of the coveted specialty board certificates, then each branch of medicine must adopt the policy of certification in order to compete with other branches for new medical talent. In other words, if any specialty is to survive as such it must offer some mark of distinction which will set those physicians who have had extended education or training in some way apart from those who are presumably less well educated or trained.

In the specialties which have created certifying boards to date there has been no great difficulty in establishing the requirements for certification. This is due to the fact that the sphere of activity in the respective specialties had become pretty well fixed. The contrary is true in the case of industrial medicine. The functions of the industrial physician have not yet been determined, consequently there must inevitably be great difficulty in setting up standards for specialty certification.

Several organizations have shown active interest in the problem of industrial medicine as a specialty. Among these may be mentioned the U. S. Public Health Service, the American Academy of Occupational Medicine, the American Association of Industrial Physicians and Surgeons, and the American Medical Association. The Chairman of the Council on Industrial Health of the last named group has had the following to say on the subject<sup>2</sup>: "First of all, we are convinced that occupational medicine is a distinct specialty which can be defined. Secondly we believe that it is important that a certification board be established in this specialty. It will do much to elevate the standards of practice in the field of occupational medicine." Undoubtedly, as Dr. Seeger has stated, the field of occupational medicine can be defined. Unfortunately, up to the present time nobody has successfully tackled the job, although a few attempts have been made. That of the Council on Industrial Health of the American Medical Association is as follows<sup>2</sup>:

"The principal components of occupational medicine are:

"1. Health conservation.

The physician in industry is expected to maintain and improve health, fitness and productive capacity through physical, mental and emotional appraisals, job evaluation and placement, health counselling, health education and through the application of medical and psychiatric technics to industrial human relations.

"2. Medicine and surgery.

Medicine and surgery in industry deal with occupational diseases and surgery of trauma including disability evaluation, rehabilitation and medico-legal aspects, control of preventable illness, the industrial implication of the medical and surgical specialties and emergency care.

"3. Environmental Hygiene.

Environmental hygiene is concerned with the detection and control of occupational exposures, general plant sanitation and house-keeping, personal hygiene of workers, accident prevention, the application of regulatory codes and factory inspection laws.

"4. Administrative methods.

Administration includes medical department planning and operation, integration with related in-plant functions, maintenance of adequate records and statistics and correlation with community medical, hospital and health services."

Certainly the Council on Industrial Health is to be commended for having put into writing many of the important components which go into the practice of industrial medicine. Unfortunately, the terminology in several places tends to be somewhat vague, and there appear to be some important omissions. Just what is meant by "physical, mental, and emotional appraisals" is not entirely clear. What sorts of "medical and psychiatric technics" are referred to and how they are to be applied require further elucidation. It would appear that health conservation is to be achieved without diagnosis and treatment of disease. It is not stated whether the control of preventable illness is to be limited to diseases arising in the course of employment or is to include all preventable diseases. No doubt the Council will be more specific on some of these points as its thinking progresses and as it receives the comments of other interested persons.

The American College of Surgeons has defined the field of industrial medicine by stating that<sup>3</sup>:

"An adequate industrial medical service requires:

"1. A definitely organized plan for the medical service.

"2. A definitely designated staff of qualified physicians, surgeons, and attendants.

"3. Adequate emergency, dispensary, and hospital facilities.

"4. Preplacement and periodic physical examinations—to be made only by qualified medical examiners.

"5. Efficient care of all industrial injuries and occupational diseases.

"6. Reasonable first aid and advice for employees suffering from non-industrial injuries and illnesses while on duty. For further professional care such employees should be

referred to their own private or family physicians.

"7. Education of the employee in accident prevention and personal hygiene.

"8. Elimination or control of health hazards.

"9. Adequate medical records, accessibly filed in the medical department under responsible medical supervision.

"10. Supervision of plant sanitation and all health measures for employees by the physician or surgeon in charge.

"11. An ethical and coöperative relationship with the family physician.

"12. The use of approved hospitals."

If industrial medicine (or occupational medicine) were to embrace only those functions listed by the American Medical Association and the American College of Surgeons it would cover a tremendous range and diversity of activities: physical, mental, and emotional appraisals, job evaluation and placement, health counseling and education, application of medical and psychiatric techniques, occupational diseases, surgery of trauma, disability evaluation, rehabilitation, medicolegal matters, preventable illness, detection and control of occupational exposures, sanitation, personal hygiene, accident prevention, planning and administration, records and statistics, community correlation, physical examinations, first aid. Obviously no one individual, without an inordinately long period of training, could become expert in such a variety of subjects. Before specialty certification in industrial medicine can be established, it will be necessary to decide which items in the above list must be mastered by the candidate.

An essential corollary to the setting up of specialty certification is the provision of facilities for graduate and postgraduate training. At the present time such facilities both for didactic instruction and field training are quite limited, but there are indications of growth. The task of the educator is made difficult first, by the great variety of subjects he must cover and second,

by the fact that there is no unanimity as to what subjects he should teach. There is a definite need for some agreement among educators as to the basic content of curricula designed to train specialists in industrial medicine. Until the field becomes better defined, the combination of training in internal medicine, traumatic surgery, and public health are suggested as desirable for an industrial physician.

#### A PATTERN FOR INDUSTRIAL MEDICINE

The statement that "the present is pregnant of the future" is as true today as it was when originally made by Leibnitz some 250 years ago. This being the case, one has but to examine the present situation in medicine in order to get a pretty good idea of probable future developments. Most significant among current trends is increased utilization of insurance methods for budgeting the costs of illness. A second important development is that of group medical practice. In general, the tendency is to plan for medical care rather than to trust to chance that illness will not occur. Preventive medicine, based on periodic examinations and early diagnosis, is commanding renewed interest.

Working people have learned that through collective action they are able to secure benefits, not only in wages and working conditions, but also in connection with medical care, which as individuals they might not be able to obtain. Both they and their employers have recognized that the employed group constitutes a suitable and convenient unit to which insurance against the costs of sickness can be applied. Employers in increasing numbers are appreciating the advantage of assisting their employees in maintaining health and in securing medical care. Proof of these statements is found in the phenomenal growth among employed persons of Blue Cross plans and of so-called group health and accident insurance.

with employers frequently bearing the cost entirely or in part.

The pattern which appears to be evolving in medicine is based on prepayment methods of defraying costs and group practice for providing service. This pattern is not new in the field of industrial medicine. A successful industrial prepayment medical plan has been operated by the Tennessee Coal, Iron and Railroad Company in Birmingham, Alabama, since 1913. A recent report<sup>6</sup> indicates that this plan provides complete medical care for 33,000 employees and 120,000 dependents. Care is provided at the place of work, in the home, hospital, or clinic, by a medical practice group of 75 physicians, 12 dentists, and 111 registered graduate nurses. The costs are shared jointly by employer and employee. A similar plan has been serving the employees (and their dependents) of the Standard Oil Company of Louisiana at Baton Rouge since 1924, and during World War II a plan along the same lines was developed by the Kaiser-Permanente groups. At the present time there are well over one hundred prepayment medical care organizations which have had their origin in industrial corporations. Now that opposition on the part of organized medicine to the general principles of prepayment and group practice has been pretty well dissipated it is reasonable to expect that there will be significant developments along these lines.

Industry is interested in maintaining and improving the health of its employees as an essential in maximum production. Labor is interested in obtaining medical care of high quality at a cost within its means. The physician is interested in practicing high quality medicine and in adequate remuneration for his efforts. The combination of prepayment and group practice would seem to offer great possibilities for achieving these goals. Under such a system the

industrial physician will take care of those medical problems which can be most efficiently handled at the place of work, referring the more complicated cases to appropriate members of his medical group. The patient thus obtains the benefits of team work medicine without the disadvantages of divided responsibility. The illogical and undesirable situation of having one doctor responsible for illness resulting from work and another for non-industrial illness is eliminated. Small industrial plants can enjoy the same advantages as the larger ones by arranging for part-time services of a physician who belongs to a medical group. As long as physicians remain in control of the development of plans of the type indicated, they need have no fear of losing their independence or economic security. If, through negativism or lack of courage, they fail to assume constructive leadership, industrial medicine may find itself going backward instead of forward.

#### REFERENCES

1. Industrial Health. A General Statement of Medical Relationships in Industry Presented by the Council on Industrial Health. *J.A.M.A.*, 114: 573-586 (Feb. 17), 1940.
2. Proceedings of a Conference on Industrial Medical Education, Council on Industrial Health and Council on Medical Education of the American Medical Association, Chicago, Feb. 9, 1917 (Mimeographed).
3. *Medical Services in Industry and Worker's Compensation Laws*, revised edition, Chicago, American College of Surgeons, 1946.
4. Seeger, S. J. Education in Industrial Health. *J.A.M.A.*, 118: 1017-1019 (March 21), 1942.
5. Lynch, Dan. Absenteeism, Analysis and Method of Control, mimeographed, date and source not stated.
6. Stern, Bernhard J. *Medicine in Industry*. New York: The Commonwealth Fund, 1946.
7. *Medicine in the Changing Order*. New York: The Commonwealth Fund, 1947.
8. Plumley, H. L. *Budgeting the Cost of Illness*. New York: National Industrial Conference Board, 1947.
9. Compulsory Sickness Compensation for New York State, New York, 1947, quoted by Plumley H. L., ref. 8.
10. Klem, M. C. Prepayment Medical Care Organizations, Social Security Board, Bureau of Research and Statistics, *Bureau Memorandum No 55*. Washington (rev. ed.) 1944.

# Planning for the Chronically Ill\*

Joint Statement of Recommendations by the American Hospital Association, American Medical Association, American Public Health Association, and American Public Welfare Association

## INTRODUCTION

THE conquest of many of the acute communicable diseases has focused increasing attention on chronic diseases<sup>1</sup> as the major causes of death and disability. Numerous communities are now awakening to their responsibilities for the chronically ill. In eight states and at least four cities, action to meet the problem of chronic illness has already been taken or is in the planning stage.<sup>2</sup>

There is a great need for comprehensive planning to insure that the widespread interest in chronic disease is channeled into sound and effective activity. Such planning requires the mutual coöperation of the agencies and professions most vitally concerned with the problem. For this reason, representatives of the American Hospital Association, the American Medical Association, the American Public Health Association, and the American Public Welfare Association have considered the experience already accumulated and have prepared this statement as a guide in the development of community programs. Although planning to meet the economic needs of the chronically ill is of vital importance, primary consideration is given here to the health and medical aspects of the total problem,

including prevention, research, treatment, and rehabilitation.

It is hoped that the general public, as well as legislators and members of the health and welfare professions, will find this statement a useful guide and stimulus to planning for the chronically ill.

## EXTENT OF CHRONIC ILLNESS

Chronic illness affects nearly every family. It has been conservatively estimated that about 25 million persons, more than a sixth of the population, have a chronic disease.<sup>3</sup> Some 7 million of these have appreciable disability from their illness,<sup>4</sup> while 1½ million are invalids.<sup>5</sup> The most important of the chronic diseases are heart disease, arteriosclerosis, high blood pressure, nervous and mental disease, arthritis, kidney disease, tuberculosis, cancer, diabetes, and asthma.<sup>6</sup> Because special provisions have been made for patients with tuberculosis and mental disease, they are not included in the scope of this statement.

Each year chronic diseases cause nearly a million deaths, and are responsible for the loss of almost a billion days from productive activity.<sup>3</sup> Appropriate action can prevent much of this staggering loss to our economy.

Although the prevalence of chronic diseases increases with age, and the progressive aging of our population is one of the factors responsible for the growing importance of the problem, it

\* This report has been approved by the A.P.H.A. Committee on Administrative Practice, upon recommendation of the Subcommittee on Medical Care, and approved by the Executive Board of the A.P.H.A. It has been adopted as an Official Statement of the four associations.

must be borne in mind that chronic illness occurs at all ages. Fully one-half of the chronically ill are below the age of 45, and 16 per cent of them are under 25. More than three-quarters are persons in the productive years from 15 to 64.<sup>3</sup>

Chronic illnesses in childhood and adolescence are particularly important because they influence the period of growth as well as the entire period of adult life. They may have serious effects on the emotional development and social adjustment as well as the education of their young victims.

#### PREVENTION

The basic approach to chronic disease must be preventive. Otherwise the problems created by chronic diseases will grow larger with time, and the hope of any substantial decline in their incidence and severity will be postponed for many years.

There is a need to intensify health department programs to control chronic communicable diseases such as tuberculosis, syphilis, hookworm, and malaria. Accident prevention programs—in industry, on the farm, and in the home—should be greatly expanded to reduce the incidence of physical handicaps.

The promotion of optimal health throughout life is an important factor in the prevention of chronic illness. Child and school health programs need to be strengthened. Wide expansion of nutrition, mental health, and housing programs can have important effects in decreasing the incidence of chronic illness.

The success of programs to conserve the health of infants and children suggests the possibility of achieving effective health programs directed to adolescents as well as adults. The health programs of our high schools and colleges, including medical examinations and correction of defects, physical fitness and recreational programs, and

health education require intensive development.

The periodic medical examination of apparently well persons needs to be explored on a new basis, including selective laboratory and clinical examinations chosen for particular age, sex, geographical, and occupational groups. These include serology, chest x-ray, urinalysis, electrocardiography, ophthalmoscopic and other examinations.<sup>7</sup>

Industry and labor can play an important constructive role in this connection by encouraging health examinations of employees, including laboratory procedures, on a much larger scale than at present.

The recent development of special phases of the health examination, particularly in the fields of tuberculosis control and cancer detection, is especially noteworthy. The great interest shown by the medical profession and the public in chest x-ray surveys and in the establishment of diagnostic centers to examine apparently well persons for early signs of cancer represents a distinct advance in preventive medicine. It may well initiate a basic shift in emphasis in the medical care of adults comparable to that which has occurred in obstetrics and pediatrics, in which preventive supervision and examination of presumably well persons is a major requirement of good medical practice. There is a need to explore the practical possibilities of preventive examinations to discover all possible disease, making full use of the diagnostic aids developed by modern medical technology.

#### RESEARCH

Further advances in the prevention as well as the treatment of many chronic diseases are dependent on research. Although a good deal of research is now being carried on in chronic diseases, only a fraction of the total need is being met.

War experience in medical research



has made it clear that we must broaden our vision and think in terms of research planned and organized on a much larger scale than any now contemplated. This requires the training and support of a much larger corps of medical scientists, and the development of teams of research workers to carry forward coördinated programs. The greatest emphasis must be placed on those diseases which are the most important causes of death and disability, such as heart disease, high blood pressure, arteriosclerosis, arthritis, kidney disease, cancer, diabetes, and asthma.

Research institutes in chronic diseases, associated with clinical facilities, may well become the basic units of such a program. In New York City, the research services of the Goldwater Memorial Hospital have carried on important research in kidney disease, arteriosclerosis, malaria, and cirrhosis of the liver.<sup>8</sup> In Illinois, the State Commission on the Care of Chronically Ill Persons is considering the advisability of developing a state supported university research institute for the study of chronic illness which would, in addition to suitable research facilities, provide beds for 200 patients and an outpatient service for 15,000 patients a year.<sup>9</sup> The National Institute of Health is formulating plans for intensive laboratory and clinical research in heart disease, geriatrics, cancer, and mental disease.

There is a great need for administrative research, for more precise information on methods of providing the necessary services for the chronically ill. Basic research on some of the administrative problems is already being undertaken,<sup>10</sup> but the field is a relatively new one and requires intensive study and development.

Research is also necessary in the social and psychological aspects of chronic illness. The influence of these factors in the development of specific chronic diseases needs to be more fully

determined, while the effect of chronic illness on the individual's social relationships needs further study.

#### MEDICAL CARE

In the past, the approach to chronic illness has been primarily concerned with institutional care for advanced stages of disease. There is need for a new orientation which places major emphasis on the early stages of chronic illness with a view to preventing or at least delaying the progress of the disease process.

Diagnosis and treatment of illness at its inception is essential to the control of chronic disease. Competent medical supervision, if brought into play early enough, can have an important preventive effect. The most dramatic expression of this fact is found in cancer control, where diagnosis of early symptoms and prompt treatment may be a life-saving measure. Early diagnosis and proper management of diabetes prevents the serious complications of infection, gangrene, and coma. Similarly, early diagnosis and treatment may prevent complications or prolong the lives of persons with heart disease, hypertension, rheumatic fever, peptic ulcer, and other chronic diseases.

The barriers to early competent diagnosis and treatment must be removed. This requires the construction of hospital and laboratory facilities to cover all our communities, with co-ordination of facilities to insure a maximum of diagnostic and therapeutic effectiveness for the individual patient. Health and medical agencies need to plan to fill the great needs for personnel as rapidly as possible. Means must be found to remove the basic economic barriers to early diagnosis and therapy.

Health departments, which have carried on excellent educational activities in communicable disease, should turn in increasing numbers to the larger field of chronic illness and teach

the public the facts about heart disease, cancer, diabetes, and other chronic diseases, with special emphasis on early signs and symptoms and the importance of early and continued medical supervision.

The concept of medical care must be broadened to include the social factors which play a vital role in the progress of chronic illness. Physicians have learned, for example, that it is not enough to cure a patient with minimal tuberculosis and send him back into the community. On the contrary, he must be observed carefully over a long period of time for signs of reactivation of the disease process. Even more important, the physician must draw on community-resources in order to change the patient's environment to prevent breakdown. If the patient's previous occupation called for strenuous physical exertion, he should be retrained for office work or some other light occupation so that he can live with his tuberculosis or other chronic disease. Occupational retraining and job placement are essential therapeutic and preventive measures.

Several general considerations should be borne in mind in planning to provide adequate medical care for the chronically ill.

First, the care of the chronically ill is inseparable from general medical care. While it presents certain special aspects, it cannot be medically isolated without running serious dangers of deterioration of quality of care and medical stagnation.

Second, major emphasis must be given to coördination and integration of services. The person who is chronically ill will receive the type of care which he specifically needs only if provision has been made for the highest possible degree of coördination. Since the medical condition of the chronically ill person is not static but changes with time, it is essential to develop smoothly

operating mechanisms for referral from one type of care to another.

Third, facilities for the care of the chronically ill should be planned for the community as a whole and not for the indigent alone. Chronic disease strikes all sections of the population, and the lack of facilities is as great for those who are able to pay as for those who are not. The facilities for chronic disease should be community institutions serving all sections of the population. They will in this way achieve a greater degree of financial stability because of the additional income from those able to pay, and will be able to furnish a higher quality of care.

Fourth, the services and facilities necessary for the medical care of the chronically ill require considerable and continuing financial expenditures in order to maintain the quantity and quality of care offered. Good medical care for chronic illness cannot be purchased on an "economy" basis.

Fifth, and most important, the goal of medical care is to maintain and restore the chronically ill as independent and self-supporting members of the community. Major emphasis should be placed on home and office care, with hospital care, convalescent care, and rehabilitation serving where possible to return the chronically ill to productive community life, and with nursing home facilities providing for those whose medical condition is such that they cannot remain in their home environment.

#### HOME CARE.

The majority of persons who are chronically ill can best be cared for in home, office, and clinic.

It is unwise as well as impractical to consider a separate home, office, or clinic service for the chronically ill; their needs are best met by inclusion in the general community medical care program.

Ready access to diagnostic and specialist service is essential to adequate care for chronic diseases, since many of them are difficult to diagnose and treat.

One of the most pressing needs is for an expansion of public health nursing service to provide bedside and other nursing services for the chronically ill. Most rural communities and small cities do not have sufficient public health nurses to provide adequate bedside nursing care. Some of the larger cities have well organized bedside nursing programs, but even here the number of nurses is generally below the estimated minimum of one nurse per 2,000 persons to carry out all public health nursing activities including bedside care.<sup>11</sup> In addition to increasing the number of public health nurses, there is need to train them to provide valuable assistance to physicians in the time-consuming task of educating the individual patient in the proper understanding and management of his chronic illness.

Much wider use should be made of practical nurses and nurses' aides, working under the supervision of the public health nurse, for duties which do not require the training and experience of a graduate nurse.

Housekeeper service should be widely encouraged; there has already accumulated ample experience to show the value of the visiting housekeeper in the home care of chronic illness.<sup>12</sup> Housekeeper service performs the important social function of enabling the chronically ill patient to remain at home, and has an economic value in helping to reduce the need for expensive institutional facilities.

Other measures which enable chronically ill persons to be cared for at home include improved housing, supervised boarding homes, medical-social service, recreational and occupational therapy, and vocational rehabilitation. Social security measures to maintain income

such as disability insurance, old-age insurance, and public assistance are likewise of vital importance.

#### HOSPITAL CARE

The large number of chronically ill persons in general hospitals who require long-term care represents a serious problem to hospital administrators.<sup>13</sup> The general hospital as at present constituted is often unsuited to the care of long-term patients, since it is geared primarily to the therapeutic and general requirements of the acutely ill. It may lack adequate departments for physiotherapy, occupational therapy, and rehabilitation, as well as sun porches, recreational facilities, educational facilities for children, and an understanding of the social and psychological needs of the chronically ill.

The average long-term patient requires less costly care than that provided in the acute general hospital.<sup>14</sup> To continue to care for the long-term patient in the acute general hospital is wasteful; it provides care which is more expensive than he actually needs, and which is often unsuited to his requirements.

The construction of hospital facilities for the chronically ill has been encouraged by the passage of the Hospital Survey and Construction Act, which provides federal aid for such facilities up to a maximum of two beds per 1,000 population.<sup>15</sup>

There is already evident a tendency in some localities to build chronic disease hospitals in areas remote from the medical center and the general hospital and with no relation to them. This trend unfortunately follows the pattern already laid down in the construction of our tuberculosis and mental hospitals, a pattern which has resulted in many instances in the medical isolation and stagnation of these special institutions.

Hospital facilities for long-term illness should be built in the very closest re-

lation to teaching centers and general hospitals.

The specialized chronic disease hospital is suitable in large cities, where it can be located on the grounds of or very closely related to a medical school or teaching general hospital. Special consideration should be given to planning the facilities for children who are chronically ill. While an official or voluntary organization may be responsible for the construction and maintenance costs, the medical school should provide the attending and resident staff and utilize the facilities for research and medical education in chronic disease.

It is important that the specialized chronic disease hospital serve as the consultation center for chronic disease in its medical service region.<sup>16</sup> It should maintain formal professional affiliation with general hospitals in the region that care for chronic patients, in order to provide consultation and teaching visits from the center to the general hospitals as well as the referral of patients to the center for special study.

Most patients with chronic illness who require hospitalization are best cared for in a unit of the general hospital especially designed to meet their needs. This arrangement encourages patients to seek and use care since it is near their homes, families, and friends; makes available to them the existing facilities of general hospitals; provides opportunity to internes, nurses, and staff for experience and teaching in chronic disease; avoids expensive duplication of existing general hospital facilities; and affords the most ready means of transfer to and from the acute and chronic disease sections of the hospital when needed. Further, it allows for greater flexibility in hospital planning by making it possible for future, unforeseen shifts in the relative proportions of patients with acute and chronic diseases to be met by changing the designated use of either chronic

or acute beds in the same hospitals.

Many advantages of this plan would be lost if the chronically ill were simply intermingled with all other patients in general hospitals. The provision of a special wing or floor devoted to long-term patients insures that the special needs and problems of chronic disease are not lost sight of in competition with the more urgent and dramatic needs of the acutely ill. It makes possible the planning of the special unit in conformity with its special purpose, both as to architecture and staff. It makes it easier to provide occupational and recreational therapy, special physical therapy, rehabilitation and other services essential to the care of long-term patients. It facilitates a more economical use of nursing personnel, the utilization of a larger proportion of attendants, and less intensive medical staff attendance than is needed in the section of the hospital devoted to patients with acute illnesses.

Under no circumstances should chronic disease hospitals or units be limited to the indigent. The lack of facilities is felt by all sections of the population. High standards will be maintained most effectively if the facilities are geared to meet the requirements of the entire community. Also, the admission of patients who are able to pay will reduce the need for tax funds. It must be recognized, however, that prolonged illness exhausts the financial resources of many patients, necessitating payment from tax funds for their care.

#### CARE IN NURSING HOMES

Chronically ill persons who need active and continuous medical care should be treated in a hospital. On the other hand, there are many chronically ill persons who are more or less disabled by their illness, whose requirements for care can be met by practical nurses and attendants with medical and nursing

supervision, and who cannot or should not remain at home. Care for such persons should be provided in nursing homes.

The following example may make the difference clear. A person who has suffered a cerebral hemorrhage with paralysis of one side of his body requires hospital care. This care will extend over a period of weeks and months, during which time he will receive intensive physical therapy to restore the maximum possible use of his muscular system. When no further improvement can be obtained by medical treatment, and he is left with a good deal of disability which makes it impossible for him to be cared for at home, he is eligible for care in a nursing home.

Nursing homes, both private and public, should be brought under state licensure laws in which provision is made for minimum standards and regular inspection. The minimum standards should require continuing medical supervision, including complete medical examinations of patients prior to admission to the nursing home and follow-up examinations at definite intervals, as well as physician visits on a regular basis and on call. The standards should call for a sufficient number of practical nurses and attendants to meet the full needs of the patients. They should provide for at least one full-time graduate nurse in charge of nursing care.<sup>17</sup> The standards should require facilities for recreation and occupational therapy, for a maximum of privacy and individual attention, and for cheerful and homelike surroundings. Construction should meet adequate standards of safety and sanitation.<sup>18</sup>

#### *Private Nursing Homes*

Experience has demonstrated that improvement in the quality of private nursing homes cannot be obtained merely by passage of a licensure law. The power to inspect and license

nursing homes carries with it the responsibility for carrying on an intensive educational campaign, working with the individual nursing homes to improve the care given. The device of placing each new nursing home on a six month probationary period, during which time there is a great deal of educational assistance from the licensing agency, has been demonstrated to be an effective method of raising standards.<sup>19</sup>

It is suggested that wherever possible, the quality of medical and nursing supervision can be greatly improved through arrangement with the medical board of a nearby hospital to provide the necessary medical services.

One of the most serious drawbacks to adequate care by private nursing homes is the low payments made by welfare agencies for clients requiring nursing home care. A sharp upward revision of payments by welfare agencies, to bring them up to the actual cost of care, is an indispensable prerequisite to raising standards. At the federal and state levels, liberalization or elimination of the ceiling on payments for public assistants clients is indicated.

#### *Public Nursing Homes*

The realization that a large proportion of the population of county homes or almshouses consists of chronically ill adults has led to a widespread movement to convert them into public nursing homes.

It is clear that such conversion does not make the almshouse a chronic disease hospital, but rather a nursing home for the chronically ill.

County homes should be converted into public nursing homes only if their physical facilities are adequate, if they are within reasonable distance of general hospitals with which close medical relationships are maintained, and if the responsible authorities are prepared to meet the minimum standards described previously: namely, adequate medical

and graduate nursing supervision; sufficient personnel to meet the full needs of the patients, including medical-social service if possible; provision for privacy, a cheerful and homelike atmosphere, recreational and occupational therapy; and construction which meets safety and sanitation requirements. Many county homes cannot meet these conditions and should therefore not be considered for conversion.

It is suggested that conversion be planned on a state-wide basis, with the most careful evaluation of the suitability of individual almshouses for conversion. Financial and technical assistance by the State to localities planning conversion will make it possible to achieve higher standards of care. Public nursing homes should be included in the provisions of nursing home licensure laws.

A factor which will help obtain increased community interest, better administration, and higher quality care in public nursing homes is the admission of patients able to pay part or all of the cost of care. There is a considerable demand for public nursing home care on the part of patients able to pay. By opening its facilities to such patients the public nursing home will not only improve its financial position but will perhaps begin to free itself from the almshouse tradition and serve as a public facility for the entire community.

The Social Security Act should be amended to allow federal matching to states for assistance to patients who wish to enter public medical institutions, including nursing homes, that meet adequate standards. Payment for nursing care in public as well as private homes should be commensurate with the actual cost.

#### *New Institutions*

The shortage of institutions for nursing home care of the chronically ill cannot be met by present facilities or

by the conversion of county homes. There is a definite need for new construction.

It is recommended that voluntary and governmental general hospitals which have chronic disease pavilions give serious consideration to establishing nursing home facilities for the chronically ill. These facilities should be built on the grounds of the general hospital or within a reasonable distance. There should be close administrative, medical, and nursing relationships between the hospital and the nursing home.

The specialized chronic disease hospitals located in teaching centers should likewise maintain nursing homes which can be utilized for research and training and will set standards of quality of nursing home care.

The construction of new institutions should be closely integrated with state plans for reconversion of public homes and utilization of private nursing homes in order to prevent an overabundance of facilities in some areas and lack of facilities in others.

#### CONVALESCENCE AND REHABILITATION

Undoubtedly the most neglected aspect of chronic illness is that of convalescence and rehabilitation.

Only recently has there been recognition of the fact that convalescent care is an important feature of the care of the chronically ill. Chronic diseases often run a course of many years, with periods of relative well-being alternating with periods of illness. Following a flare-up of illness adequate convalescent care may lead to complete or partial rehabilitation, and may help delay the progress of the underlying chronic disease. Such convalescent care undoubtedly conserves hospital beds and performs important therapeutic and preventive functions. Examples of chronically ill persons requiring convalescent care would include those recovering from a period of heart failure.

an attack of acute rheumatic fever, or a flare-up of arthritis. Then there are persons who have a chronic illness such as diabetes or heart disease, and develop pneumonia or some other acute illness, and need convalescent care after recovery from the acute illness.<sup>20</sup>

There has been a large growth of convalescent homes for children with rheumatic heart disease and other crippling conditions. It is essential that such convalescent homes be located near enough to general hospitals to permit close professional relationships and adequate medical supervision.

Convalescent homes for adults have never been developed to any appreciable extent in the United States. Most convalescent care for adults is now provided in nursing homes which also care for non-convalescent patients. On the whole, there has been insufficient appreciation of the value of convalescent care and rehabilitation in the care of the chronically ill.

Recent experience with planned convalescence and rehabilitation in the armed forces has demonstrated their great potential usefulness. By providing physical reconditioning, educational training, recreational activities, and vocational guidance, it was found possible to shorten the period of hospitalization, reduce the incidence of recurrences, and return a larger proportion of men to active duty.<sup>21</sup>

Planned convalescence and rehabilitation are particularly important in chronic disease. The chronically ill have to be made conscious of their limitations early in the course of the disease, and many of them must be retrained for new occupations so that they may stay within the limits of activity prescribed by their illness and yet maintain their economic independence.

Probably the first steps along these lines will be taken by university hospitals, some of which have already made plans for rehabilitation centers as an

integral part of their medical program.

In 1943, Congress broadened the scope of the national rehabilitation program. As a result, state rehabilitation agencies were able to rehabilitate successfully nearly 42,000 persons in 1945. These were generally persons with long standing chronic impairments and illnesses—orthopedic disabilities, speech, hearing, and sight defects, poliomyelitis, tuberculosis, mental disease, heart disease, asthma, hernia, and other conditions.<sup>22</sup> That the need is still far from being met is indicated by the fact that the estimated backlog of persons in need of and entitled to such service is between 1½ and 2 millions.<sup>23</sup>

Of the 42,000 disabled persons who were successfully rehabilitated in 1945, nearly 79 per cent were unemployed at the time of applying for rehabilitation service, and 18 per cent had never been employed. The average yearly income before rehabilitation, including those who received assistance from public or private sources, was \$288. The average annual wage after rehabilitation was \$1,764. The total income of the group was increased by rehabilitation from 12 million dollars a year to 74 million, a sixfold increase.

In the past, many of the disabled have had to be supported by public or private assistance at a cost up to \$500 a person each year. Vocational rehabilitation costs an average of only \$300 a person, and this cost is not repeated.<sup>22</sup> On the contrary, rehabilitation changes the individual into a self-sustaining productive member of the community. It is clear that rehabilitation is economically and socially sound.

The results achieved with long standing chronic impairments and diseases point up the great potentialities of rehabilitation instituted early in the course of chronic illness.

#### COORDINATION OF SERVICES

The problem of chronic disease pre-

sents many aspects—prevention, research, medical care in home, hospital and nursing home, and convalescence and rehabilitation.

Undue emphasis on any one aspect would be unwise, uneconomical, and ineffectual. For example, to concentrate on the provision of medical care without paying serious attention to prevention and research would postpone for many years any basic attack on the problem. On the other hand, it is impossible to focus sole attention on research because of the very urgent need for medical care. Likewise, to provide hospital beds for chronic disease without making nursing home facilities available would result in many beds being occupied by patients who do not need hospital care. Too great an emphasis on nursing homes would deprive many patients of the specialized hospital care which is necessary for their improvement. Failure to plan adequately for home care or for convalescent care and rehabilitation would defeat the purpose of the program—to maintain and restore the individual as a self-supporting productive member of his community.

There is a great need for coöperation and coördination of the numerous agencies concerned with chronic disease: health, welfare, and education departments, hospitals, medical societies, medical schools, social agencies, rehabilitation services, nursing homes, etc. In some communities this coördination has been achieved through the establishment of central planning and coördinating bodies which study the various aspects of the problem, make the facts known to authorities and the public, stimulate needed services, assist in securing necessary facilities, and act as information centers for patients, physicians, and health and social agencies.<sup>24</sup>

The total problem of chronic disease is not a series of separate problems which can be solved one by one, but

rather a complex of interrelated problems which require simultaneous solution. It is recommended, therefore, that coördinated and comprehensive planning be undertaken at all levels in order to achieve effective action to meet the challenge of chronic illness.

#### REFERENCES

1. The term "chronic disease" is susceptible to various definitions. An administrative definition of chronic disease has been suggested as follows: "A disease that may be expected to require an extended period of medical supervision and/or hospital, institutional, nursing, or supervisory care." (Rogers, E. S. Chronic Disease: A Problem That Must Be Faced, *I.J.P.H.*, 36:345 (Apr.), 1946.) In the National Health Survey, chronic disease was defined for statistical purposes as "a disabling or non-disabling chronic pathological condition known to the informant, the symptoms of which had been recognized for at least three months." (Perrott, G. St. J. The Problem of Chronic Disease, *Psychosom. Med.*, 7:22 (Jan.), 1945.) Another definition is that used for survey purposes by the Public Welfare Council of Connecticut, "A disease or condition of the body or personality which has been present at least six months or which may be expected to continue at least six months and which interferes with one's occupation and normal physical and social life." (*Need for a State Infirmary for the Care and Treatment of Aged, Infirm, and Chronically Ill Persons*, Public Welfare Council, Hartford, 1944, p. 4.)
2. The states referred to are California, Connecticut, Illinois, Indiana, Maryland, Massachusetts, New Jersey, and New York. The cities are Chicago, Cleveland, Milwaukee, and New York.
3. Perrott, G. St. J. The Problem of Chronic Disease. *Psychosom. Med.*, 7:22 (Jan.), 1945. The estimates given are admittedly low because of the survey technique used.
4. National Health Survey, *Some General Findings as to Disease, Accidents and Impairments in Urban Areas*. *Pub. Health Rep.*, Reprint No. 2143, p. 2 ff. The frequency of chronic illnesses causing disability of at least seven consecutive days in a 12 month period was found to be 48 per 1,000 persons, or approximately 7 million for the total population.
5. *The Magnitude of the Chronic Disease Problem in the United States*. National Health Survey, *Sickness and Medical Care Series*, *Bull.* 6, p. 6.
6. Importance was determined by the combined indices of prevalence, mortality, disability, and invalidism. See Reference 5, p. 7.
7. Roemer, M. I. A Program of Preventive Medicine for the Individual. *Milbank Quart.*, 23:209 (July), 1945.
8. *Research, An Experiment in Municipal Organization*. Department of Hospitals, New York City, 1945, p. 48 ff.
9. Communication from R. M. Hilliard. Public Aid Director, State of Illinois.
10. The Central Service for the Chronically Ill in Chicago is making a detailed study of the needs and costs of care of different categories of nursing patients.
11. Resolution of the National Organization for Public Health Nursing, June, 1944. *Pub. Health Nurs.*, 37, 3 (Jan.), 1945.
12. Jarrett, M. C. *Housekeeping Service for Home Care of Chronic Patients*. Welfare Council of New York City, Dec. 31, 1938.
13. The percentage ranges from 7 to 20 per cent.



depending on the area surveyed. In New York City, in 1928, a fifth of the ward beds in both private and municipal general hospitals were occupied by chronic patients. (Jarrett, M. C. *Chronic Illness in New York City*, Columbia Univ. Press, 1933, Vol. 1, p. 119.) In New Jersey, in 1940, 38 general hospitals reported that 7 per cent of the total number of patients were chronically ill. (Frankel, Emil. *New Jersey Studies Problems of Care for the Chronically Ill*. *Hospital Management*, 50:19 (Aug.), 1940.) The findings to date in the Illinois State Health Department's survey of hospital facilities indicate that about 15 per cent of the beds in the general hospitals of the state are occupied by chronically ill patients (unpublished data).

14. The cost at Montefiore Hospital, a high standard voluntary chronic disease hospital in New York City, is more than two-thirds the cost in acute general hospitals. (Communication from Dr. E. M. Blue-stone, Director.) In 1945, the cost at Goldwater Memorial Hospital, a municipal chronic disease hospital in New York City, was one-half the average cost in the acute general municipal hospitals (Communication from Dr. E. M. Bernecker, Commissioner of Hospitals of New York City).

15. Public Law 725, 79th Congress, Sec. 622 (b).

16. *Planning for the Care of the Chronically Ill in New York State—Regional Aspects*. New York State Health Preparedness Commission, Albany, 1946.

*Health Service Areas*, Pub. Health Bull. No. 292, U. S. Public Health Service, Washington, 1945.

17. The present shortage of nursing personnel

makes it impossible in many instances to meet this requirement. The New Jersey State Department of Institutions and Agencies has met the situation by helping nursing home operators to make arrangements for a daily supervisory visit from the local visiting nurse association. The plan seems to be working very well.

18. A detailed description of minimum standards of nursing home care is given in *Institutional Care of the Chronically Ill*, a report issued by a joint committee of the American Hospital Association and American Public Welfare Association in January, 1940.

19. Potter, E. C., et al. *Inspection and the Power of License as Tools in the Care of the Chronically Ill*. *Public Welfare*, 2:100 (Apr.), 1944.

20. Boas, E. P. *Convalescence and Chronic Illness*. From *Proceedings of Conference on Convalescent Care*, New York Academy of Medicine, Nov. 9, 1939, p. 38.

21. Rusk, H. A. *Planned Convalescence*. *Bulletin of the New York Academy of Medicine*, 22:465 ff (Sept.), 1946.

22. *Annual Report of the Federal Security Agency, Office of Vocational Rehabilitation*, 1945, p. 15 ff.

23. Rusk, H. A. *New York Times Magazine*, May 12, 1946.

24. *The Institute of Medicine of Chicago—The Central Service for the Chronically Ill*. Health Division, Council of Social Agencies, Chicago, February, 1946.

Jarrett, M. C. *Care of the Chronically Ill of Cleveland and Cuyahoga County*. Benjamin Rose Institute. Cleveland, 1944, p. 36.

## Best Sellers in the Book Service for September

An Appraisal Method for Measuring the Quality of Housing: A Yardstick for Health Officers, Housing, Officials and Planners.

Part I. Nature and Uses of the Method, 1945..... \$1.00

Part II. Appraisal of Dwelling Conditions, 1947..... 5.00

The Control of Communicable Diseases. 6th ed., 1945..... 35

Diagnostic Procedures and Reagents. 2nd ed., 1945..... 4.00

Infant and Child in the Culture of Today, Gesell & Ilg., 1946..... 4.50

Microbiology of Foods. Tanner. 2nd ed., 1944..... 12.50

Milk and Food Sanitation Practice. Adams. 1947..... 3.25

Preventive Medicine and Public Health. Smillie. 1946..... 6.00

Standard Methods for the Examination of Water and Sewage, 9th ed., 1946..... 4.00

Voluntary Health Agencies. An Interpretive Study. Gunn & Platt. 1945..... 3.00

Order from the Book Service

AMERICAN PUBLIC HEALTH ASSOCIATION

# Uses of Statistical Data in State Health Departments\*

ELLEN B. WHITEMAN, M.P.H.

*Statistician, The Commonwealth Fund, New York, N. Y.*

STATISTICAL work being carried on in state health departments in 1940 was studied by Mountin and Flook, several years ago, for the preparation of a revised edition of *Public Health Bulletin No. 184*. Their findings indicate that all state health departments were making simple tabulations of vital statistics data; many were prepared to supply certain statistical information upon request; and about one-third were routinely preparing certain descriptive material for use by other divisions, such as lists of tuberculosis deaths. The authors of this report were, for various reasons, forced to conclude, however, that "few states go beyond their primary duty of collecting and preserving records and preparing more or less standard tabulations."<sup>1</sup>

In the few years since that study, many state health departments have taken steps to expand their statistical services. Much of this expansion has been stimulated by increased federal and state activities in special fields, such as tuberculosis control, venereal disease control, and the Emergency Maternity and Infant Care program.

In April, 1946, information on statistical services now being rendered and the types of administrative organization for giving these services, was obtained

by questionnaire from 42 state health departments.<sup>†</sup> All 42 states, as in the past, were making more or less standard tabulations of data from birth and death certificates. Recent expansion of statistical activities into new fields was evident, however, from the replies received. Health departments in 29 states reported statistical work in progress in the field of communicable diseases (including morbidity reports), 26 in tuberculosis control, 22 in venereal disease control, and 14 reported statistical work being carried on with data accumulated through the Emergency Maternity and Infant Care program. These, and other fields of statistical activity, with the numbers of states so engaged, are shown in Table 1. The nature and extent of statistical work in each of these categories varied widely. Activities which were reported in the field of communicable disease control for example, varied all the way from a simple weekly tabulation of notifiable diseases in some states to research by one state health department on the effect of ultra-violet irradiation on transmission of disease due to filtrable viruses. Likewise, statistical work in tuberculosis control included a range of projects from the comparatively simple procedure of maintaining a central register of known cases to the scientific research required for the epidemiologic study of familial susceptibility to tuberculosis.

In general, the statistical work being conducted in state health departments falls in three classifications.

\* Presented before the Vital Statistics Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 12, 1946.

<sup>†</sup> No reply was received from Connecticut, Georgia, Minnesota, Pennsylvania, Utah, and Wyoming.

TABLE 1

*Statistical Activities Reported by 42 State Health Departments, April, 1946\**

<i>Fields of Statistical Activity</i>	<i>Number of states reporting activity</i>
Vital statistics (standard tabulations).....	42
Communicable diseases (including morbidity reports).....	29
Tuberculosis control.....	26
Venereal disease control.....	22
Emergency Maternity and Infant Care program.....	14
Dental health.....	7
Laboratory tests and procedures.....	7
Crippled children's services.....	6
Cancer.....	5
Special serologic surveys.....	5
Industrial hygiene.....	4
Hospital care surveys.....	2
Accidental deaths.....	2

\* Information obtained from questionnaires sent each state health officer.

1. Simple tabulation of data collected routinely in the various divisions and services of the health department
2. Statistical analysis of data collected routinely
3. Independent investigation and research in specific problems relating to public health.

All state health departments are engaged in the first of these, that is, current tabulation of data collected routinely. In this category are such items as periodic activity reports, morbidity reports and tabulations of data on death certificates. Not all state health departments, however, are utilizing this information, by means of statistical analysis, for the full advantage of the various public health programs.

Very few state health departments are engaged in statistical research in specific fields—the third type of activity mentioned above. This type of work requires, in addition to specialists in the field concerned, the services of an expert statistician. Outstanding work of this last type was reported from 3 states. Massachusetts is carrying on cytologic research in the evaluation of the vaginal smear technique for the diagnosis of uterine cancer in symptom-free women, and a study of the genetic-environmental factors pertaining to cancer. This department in addition conducts studies on the relation of industrial environment

to health, and a study of fluorine as a preventive of dental caries. The New York State Health Department is also studying the effect of fluorine on the incidence of dental caries, and the effect of ultra-violet irradiation on the transmission of diseases due to filtrable viruses, which was mentioned above. In Tennessee, research has been carried on since 1931 in the epidemiology of tuberculosis, with intensive study of such factors as the prevalence of infection in racial groups, morbidity and mortality in households, familial susceptibility to tuberculosis, and the significance of sensitivity to histoplasmin and tuberculin.

Research of this type, obviously, depends upon the availability of highly trained personnel. While many state health departments may be unable to carry on a research program on a permanent basis, all state health departments can obtain personnel capable of analyzing the information collected routinely for the evaluation of programs and program planning. This activity is, perhaps, the primary purpose of a statistical unit in a state health department.

For many years, state health departments have been publishing tabulations of data from birth and death certificates. Such tabulations frequently fill several

TABLE 2

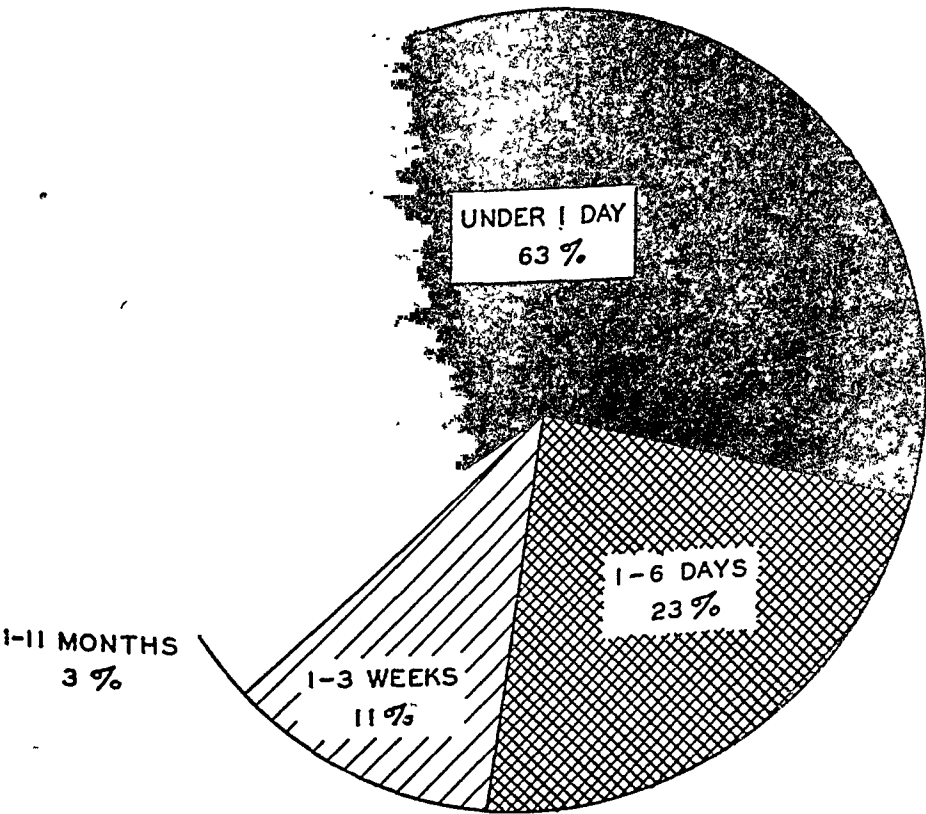
Whooping Cough Cases and Deaths with Average Annual Rates Per 100,000 Population and Case Fatality Rates, for Certain Ages, Tennessee, 1938-1942 \*

Age in years	Cases		Deaths		Case fatality Per cent
	Number	Average annual rate	Number	Average annual rate	
Total	11,168	76.6	657	4.5	5.9
Under 1	1,703	639.4	410	153.9	24.1
1	1,120	398.5	153	54.4	13.7
2	1,294	460.4	46	16.4	3.6
3	1,141	406.0	21	7.5	1.8
4	1,066	379.3	5	1.8	0.5
Under 5, total	6,324	454.8	635	45.7	10.0
5-9	3,632	255.9	16	1.1	0.4
10 and over	872	7.4	5	0.2	0.6
Unknown	340		1		

\* Data from Tennessee Vital Statistics and Tennessee Morbidity Statistics for each of the years, 1938-1942. Case rates and death rates are based on 1940 Census populations.

CHART 1

PERCENTAGE DISTRIBUTION BY AGE OF INFANT DEATHS FROM PREMATURITY MISSISSIPPI, 1943



pages in annual departmental reports, where they undoubtedly rest in peace. When the data are subjected to even the simplest type of statistical analysis, however, they can be made to answer questions pertinent to specific health problems. One example of this use of statistical data is in connection with the planning of a whooping cough immunization program. In the early part of 1942, the Tennessee Department of Public Health, with the assistance of the Commonwealth Fund, began making plans for an active program of immunization against whooping cough. The disease had been recognized as constituting a major health problem among young children and with the development of an effective vaccine it had become possible to talk in terms of prevention. Analysis of the data on mortality and morbidity in the area indicated the age groups in which immunization was most needed. Table 2 shows that whooping cough case rates, death rates, and case fatality rates were very high for children under 5 years of age. Moreover, the greatest risk of death was for very young children. Of all those dying of whooping cough in Tennessee in the 5 year period 1938-1942, 93 per cent were less than 3 years of age, 86 per cent were less than 2, and 62 per cent, or nearly two-thirds, were less than 1 year of age. Hence, if the immunization program were to lower morbidity and mortality from whooping cough, vaccinations would have to be given as early in life as practicable and concentrated on the age group under 3 years of age. This was actually the program inaugurated.<sup>2</sup>

Another use of information currently obtained from vital statistics records is illustrated by a study of infant deaths, such as one prepared by the Mississippi State Board of Health. It was evident from this work that the various specific causes of death covered by the term "prematurity" were a challenge to med-

ical and public health personnel. Of 2,774 deaths of infants under 1 year of age in Mississippi in 1943, 625 or 22.5 per cent were said to have died from "premature birth." Chart 1 shows that 63 per cent of these deaths occurred when the infant was less than 1 day old, and an additional 23 per cent occurred between the ages of 1 day and 1 week. Thus, 86 per cent of the deaths occurred in the first week of life. If the death rate in the age group under 1 year is to be reduced, therefore, emphasis must be placed first on the best possible care of mothers in the antepartum period, in order to prevent delivery before term, and on the best possible care of the immature new-born. Accordingly, with this in mind, the Mississippi State Board of Health, in 1945, held short wartime postgraduate courses in pediatrics and obstetrics which were attended by one physician out of every five in active practice in the state.<sup>3</sup> Another important phase of this program is the provision of incubators in county health departments throughout the state which are available for loan whenever needed for care of the new-born.

A third illustration has to do with the use of information from a different type of record. When many questions arose with regard to a need for modification of the school health program in Tennessee, several years ago, the existing public health service records were used as a basis of judgment.<sup>4</sup> Analysis was made of the findings on physical examinations recorded on the school health records of about 58,000 children in 6 counties. One of the many items considered was the result of vision tests. Study of vision tests at first examination showed a gradual increase in the incidence of visual defects from 2.3 per cent for 6 year old children to 6.9 per cent for 16 year olds. The data are given in Table 3 and Chart 2. It was also shown that the percentage of children found with visual defects for the first time was

TABLE 3

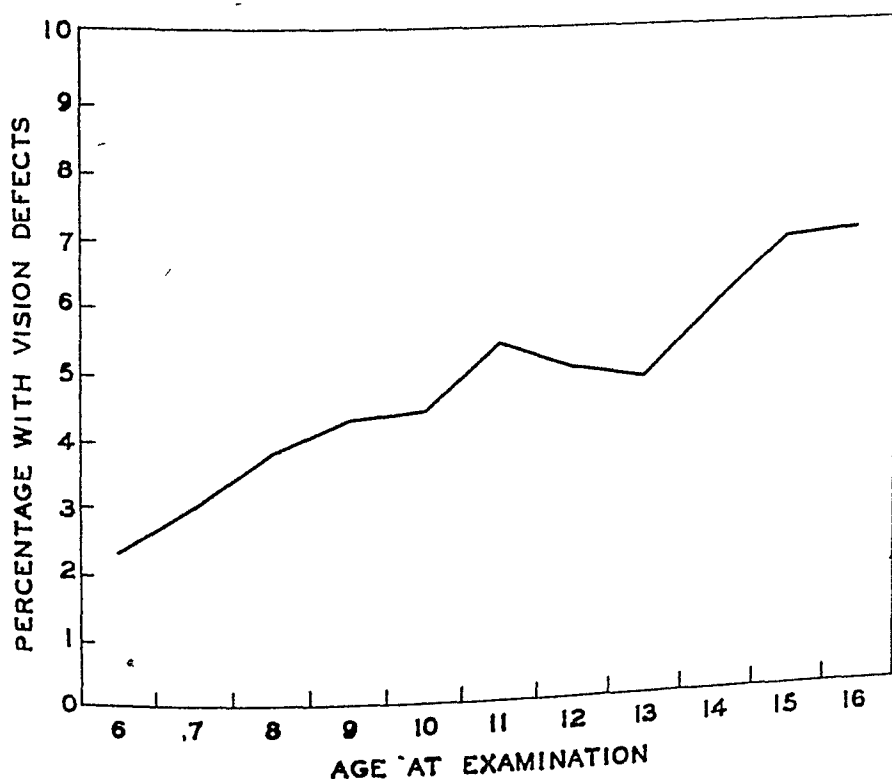
Percentage of School Children with Vision Defects at First Examination, By Age, 1930-1936  
(Six Tennessee Counties) \*

Age at examination	Children examined	Children with vision defects	
		Number	Per cent
Total	54,487	2,147	3.9
6	11,183	255	2.3
7	10,187	301	3.0
8	6,910	261	3.8
9	5,247	228	4.3
10	4,653	205	4.4
11	4,070	218	5.4
12	3,711	185	5.0
13	3,260	158	4.8
14	2,619	155	5.9
15	1,702	116	6.8
16	945	65	6.9

\* From *School Health Services*, by Walker and Randolph

CHART 2

PERCENTAGE OF SCHOOL CHILDREN WITH VISION DEFECTS AT FIRST EXAMINATION, BY AGE



DATA ON SIX TENNESSEE COUNTIES, 1930-1936. FROM *SCHOOL HEALTH SERVICES*, BY WALKER AND RANDOLPH

practically, the same on first, second, third, and fourth examinations. Since the attack rate of visual defects was fairly constant for all ages and since the prevalence of defects increased with age, the examination of children at any

one time obviously would not discover all vision defects. For this reason, the authors concluded that although a first examination of school children would, for example, reveal the bulk of heart and lung defects, annual vision tests of

all children at all ages would be needed to detect visual defects as they occurred throughout the school years.

Studies such as these just described are needed for intelligent planning by health administrators and are the mark of the mature health department. There is evidence that public health officials now more than ever realize the need for statistical evaluation of work as it is being carried on in the various fields of public health. Some progress has already been made toward establishing the necessary administrative machinery for doing so. Ten states, of the 42 submitting information to the questionnaire described above, reported that they had centralized statistical units which could render statistical service to all divisions of the health department. These states were: California, Illinois, Indiana, Louisiana, Michigan, Mississippi, Oklahoma, Tennessee, Washington, and Wisconsin. Administrative organizations for statistical work in these 10 states differ in one important respect. Five departments have organized central statistical services which are administratively independent of registration of birth and death certificates. In these services, the chief statistician is directly responsible to the state health officer. The other 5 state health departments have organized bureaus (or divisions) of records and statistics which are divided into two sections, one for registration and one for tabulation and analysis. The ways in which these two types

of organization are coordinated with other divisions of the health department have been described in detail by Linder.<sup>5</sup>

In addition to the 10 states with central statistical services already organized, six states reported in April, 1946 that they were planning to organize this type of service in the near future.

For the sound development of statistical organization in a state health department, one question is paramount: By means of what type of organization can the mass of public health data be most economically and efficiently utilized for the improvement of the whole public health program? When the public health administrator has answered this question satisfactorily, he then will be in a position to utilize to advantage the services that a well qualified statistician is equipped to give.

#### REFERENCES

1. Mountin, J. W., and Flook, E. Distribution of Health Services in the Structure of State Government: Central State Services Affecting All Branches of Public Health Work. *Pub. Health Rep.*, 58, 8: 264 (Feb. 12), 1943.
2. Tennessee Department of Public Health. *Biennial Report for the Fiscal Years 1941-1943*, p. 56.
3. Mississippi State Board of Health. *Thirty-Fourth Biennial Report, July 1, 1943, to June 30, 1945*, pp. 199, 202.
4. Walker, W. F., and Randolph, C. R. *School Health Services*. New York: The Commonwealth Fund, 1941, pp. 51-62.
5. Linder, F. E. *Organization of Statistical Work in State Public Health Offices*. Report of the Proceedings of the Second National Conference of Vital Statistics Registration Officials, Washington, March 25-28, 1941. U.S. Census Bureau, Vital Statistics. *Special Reports*, 12, 20:373-379 (April 25), 1941.

# Statistics in the Planning and Evaluation of Health Procedures\*

HUGO MUENCH, M.D., DR.P.H., F.A.P.H.A.

*Department of Biostatistics, Harvard School of Public Health, Boston, Mass.*

THE statistician is primarily engaged in the business of measuring and counting. Measurements must be made on a recognized scale, and counts on items classified by accepted criteria. Moreover, such measurements and counts are made on populations subject to numerous kinds of variation, and it is one of the chief aims of statistical method to subject these variations to some sort of orderly process. This is all axiomatic and would doubtless earn the somewhat bored agreement of most statisticians.

We are all familiar with the variability encountered in measuring biological characteristics, be they the heights of a group of children or the amounts of hemoglobin per liter of their blood. We can describe the variations we expect to find in counting individuals or their attributes, and we are at all times conscious of this variability. There is another type of variability not so continually present in our thinking: the variation in the reliability of the information on which our counts are based.

What would we think of a physicist who gave us a series of measurements of wave lengths of light, based partly on the use of an interferometer and partly on that of a meter stick, and who, moreover, threw all his results into one table without discrimination? We should be entirely justified in asking him to

omit the latter group of readings, or at least to tabulate them separately, since their only effect on the more precise results would be to dilute them and to obscure the conclusions.

At the same time, we would not ask the physicist to use an interferometer to measure a group of babies. The added precision over the meter stick would not be worth the great deal of extra trouble; we should prefer a large number of measurements with the coarser instrument to a few highly refined observations for our purposes in this case, which would be the description of height characteristics of a population.

Variation in precision attaches to the different sorts of information gathered by statistical services. Some is subject to little misinterpretation and can be gathered by almost anyone with sufficient exactness to serve the purpose. This sort of information does not suffer from collection in large quantities, because it is not seriously stratified as to accuracy at different levels of information.

At the other end of the scale there is information so highly technical, so difficult to secure accurately, that only the most painstaking investigation will assure us of its reliability. This sort of information cannot be gathered anywhere, by anybody, with the same order of certainty. For best results, the data must be obtained from their most accurate source, no matter how limited, and they can only suffer if mixed with spurious figures.

\* Presented before the Vital Statistics Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 12, 1946.



Along the middle of the scale of reliability is information which is perhaps not equally reliable at all sources, but which can be adjusted to some extent. In this way, an error introduced by the use of heterogeneous data may be compensated by the stability introduced through the use of a larger sample.

Quite properly, registration departments concern themselves with the most complete possible collection of certain items of information about people. The items are sorted and counted and any possible legitimate conclusions are drawn. Now these items of counted information range from the most indisputable of facts, through matters of informed opinion, to offhand guesses resting on foundations which are anything but secure. As long as we keep in mind which items fall into what categories, we are in no great danger; but we are at times inclined to forget.

Let us examine registration data in the light of a crude scale of reliability. On one hand, we have matters of fact yielding to no differences in interpretation—the fact of existence, for example. A person simply is here, or he is not, and there is very little room for argument. With proper diligence, plus considerable intelligence, we can keep a pretty fair record of how many people we have. We can also, with some accuracy, determine their sex, color, where they live, and (though less accurately) how old they are.

Items of this kind do not suffer by collection in large numbers, or not very much. There is little difference in their accuracy at different levels of reporting: life and death, male and female, Grand Boulevard and Hogan's Alley have about the same meaning for everybody. These are the sort of data which are most valuable when most nearly complete, because they are only very slightly tinged with qualitative error.

By their nature, these are the simple items of information, and we are not apt

to think of them as wildly exciting. We have accepted without comment for many years the fact that in improving our completeness of registration we have made more and more valuable the basic demographic data which are reported with the highest accuracy. Now we have found that these data, when intelligently developed and used by a capable department of registration and analysis, are extraordinarily valuable not only to the administrator of a health department but to many other branches of government. Although development along these lines has been largely in urban areas, similar use should be possible and profitable in smaller and more rural departments.

As soon as we begin to depart from the clear concepts of existence, of birth and of death, we enter a hazier landscape where the edges of shadows are less sharply defined and distances are sometimes deceptive. The difficulties, for a while, are not great. We still deal with matters which are fairly clear and which are quite universally defined in the same manner. Some diseases would, for example, be diagnosed the same by almost any medical man and would, when so diagnosed quite uniformly appear on a death certificate. But the difference between having a disease (in its clinical form, at least) and not having it is nowhere nearly as sharp as that between life and death, nor is even the clearest concept of a disease as well defined as is that of sex.

By no means are all disease entities distinctly defined, nor are those of most frequent occurrence necessarily the most sharply differentiated. If you doubt this, ask the next ten physicians you meet to tell you how they would distinguish mild influenza, clinically, from a severe cold. You need not expect too much unanimity even though they may have been graduated from the same school at about the same time. Conversely, the fact that there is general agreement on the

assumption that a disease is a disease and not possibly a few other things, does not mean that it is necessarily easy to establish a diagnosis. This may require special training and a host of diagnostic aids which are not at the call of all practitioners in all parts of the country.

Old Doctor Jones, who could enter a patient's room and know, after one glance at the tongue, the cause of the trouble, has unfortunately gone the way of many heroes of a simpler day. He had, after all, very few diseases to contend with and his tools of diagnosis, consisting largely of experience and common sense, were as good as those most other physicians had at their command. But the list of diseases has multiplied enormously, and old clinical entities are being bombed into two or more totally unrelated fragments on every hand. Observe what has happened in the field of the pneumonias, which we once happily divided into "lobar" and "broncho." Not only has lobar pneumonia disintegrated into a nestful of diseases, distinct at least from the viewpoints of bacteriology and epidemiology, but a host of formerly unsuspected agents is giving us atypical pneumonias, virus pneumonias, and what not. Worst of all, we cannot even hope to diagnose or distinguish them without x-rays and a modern virus laboratory.

It does not give us much specific information to lump all these entities into a group designated "other pneumonias," and it is obviously impossible to separate them without processes requiring special skills. In order to count something we must first identify it, and if its identification can be made only in special fields, then those are the only fields from which we can get reliable data. Adding a great number of items based on uncertain diagnostic methods to a small nucleus of well defined cases does not add to information, it hopelessly

clouds any conclusions we might draw from the smaller group. Yet we are apt to prefer the larger number, perhaps because we unconsciously assign to it a combination of the precision of the smaller group and the statistical stability of the larger.

If we stop to think, we must realize that medical diagnosis is definitely stratified into many areas of reliability. It is higher in a university teaching hospital with a large, trained staff than in even a very good private hospital. The city man, to whom specialized diagnostic aids are readily accessible, will on the whole make more accurately refined diagnoses than will his equally able country colleague. In our accumulated mortality and morbidity data we make little effort to stratify our information in accord with its reliability, but this variable cannot but enter into any comparisons which may be made.

I do not believe that any of us would advocate abandoning the reporting of "causes of death." With all its faults, it does give us valuable information that we cannot well obtain elsewhere. But it is most important for us to realize the severe limitations on the information we can hope to get from universal reporting of causes. Most definitely, we cannot expect nation-wide figures to give us specialized information which should be based on highly refined studies. If the death or birth certificate includes questions which cannot be accurately answered in the absence of highly specialized knowledge, it does not follow that everyone who fills out such a certificate becomes thereby a qualified specialist. What it does mean is that the few answers made in full accord with the facts are snowed under by the great majority of replies made in the light of pure or relative ignorance. If, in addition, we try for "completeness" and insist that everyone whosoever shall make some sort of answer to the ques-

tion, we merely turn the snowstorm into a blizzard and insure the thorough blockading of all roads to knowledge.

The logical answer to this problem is to restrict special information to the results of special studies. These may be as inclusive as possible under limitations of money and of personnel, but must always primarily be as expert and as unbiased as it is possible to devise them. In settling technical problems, there is no substitute for technical investigations, for expert knowledge and skill.

The reporting of deaths from tuberculosis, if reasonably accurate, will give us some important information of a rather simple nature. It cannot answer many of the special questions which are of prime importance to the administrator as well as to the epidemiologist. Special studies made in clinical environments can settle only some aspects of the problems.

To get a full answer, the disease must be studied where and as it occurs; in the population itself. But the agency which deals with populations in the field, and with their disease problems, is precisely the health department. It is in best position to make continued studies of a group or area, to bring diagnostic aids into play, to use epidemiological and statistical methodology. This type of study can give clues to many things: What is the course of tuberculosis in the community? Who are the individuals most at risk of contracting clinical disease? Who are those to whom the limited clinical facilities can most effectively be extended? And, as a by-product, the general reporting of morbidity and

mortality from tuberculosis in the area studied gains an exactness far superior to that in other areas.

It is most encouraging to see health departments set up studies of just this sort, in various fields. Naturally, the aims include quick and accurate answers to pressing administrative problems, but may and do range much farther than immediate practicability. It is obvious that such studies demand the most expert of statistical guidance and analysis; it is no surprise to see that health agencies interested in making them have also expert and efficient departments of statistics.

It is interesting to see that two of the most significant developments in recent years in the field of vital statistics derive their usefulness partly from a realization of the stratification of reliability of information. At one end of the scale, much more complete use is made of data which are inherently the most reliable in bulk. At the other, emphasis is laid on the analysis of information which, even though limited in amount, is as accurate as it can be made.

It will be interesting, in the future, to see whether it will be possible to devise means of better utilization of the mass of statistics lying in the center zone of reliability, that part lying between the extremes of mass accuracy and of the demand for highly specialized knowledge. This zone may, for all we know, be narrowing. It is conceivable that we shall be able to improve on the accuracy of much information which is now doubtful, and that the scope of our special studies will spread more and more to fill any remaining gap.

# A Discussion of Bacteriological Standards for Dehydrated Foods\*

HARRY E. GORESLINE, PH.D., F.A.P.H.A.

*Food Technologist, Poultry Branch, Production and Marketing Administration,  
U. S. Department of Agriculture, Washington, D. C.*

IN recent years there has been a growing interest on the part of consumers in the wholesomeness, quality, and nutritional value of the food products which they buy. The manufacture of raw products into forms ready for use makes it necessary for the consumer to rely on the integrity of the manufacturer, or on certain regulations, to be assured that the food product purchased is manufactured under such conditions as to present no public health hazard and that it is of such sanitary quality as to be eaten with confidence. In order to give such assurances it is necessary to establish some uniformity of operation and to express food qualities in a uniform manner. One way of accomplishing uniformity is to establish standards which will serve as a guide to the manufacturer and be informative to the consumer.

Standards have been established for certain foods and are proving their worth. The recent growth of the dehydrated foods industry and the appearance of new dehydrated products on the shelf make it seem desirable to determine the need of standards for these products. Several kinds of standards may be applied to a food product. Standards of identity and standards of quality apply to the physical and chemical make-up of the product and its

acceptability as an article of food. They aid the consumer in purchasing more intelligently and in getting his money's worth. Bacteriological standards are somewhat different but they apply directly to the above standards and are important from a public health standpoint. Foods might meet all standards of quality and identity, and be of excellent nutritional value, yet be contaminated with pathogenic microorganisms and thus present a public health hazard. On the other hand pathogenic microorganisms may be absent, yet due to faulty manufacturing techniques the product may be teeming with bacteria which markedly affect the quality and general acceptability of the food. In establishing any standard these two phases of the problem must be taken into consideration.

Fortunately, dried and dehydrated foods have a remarkably clean bill of health from the standpoint of food poisoning and other infections. Nichols<sup>1</sup> points out, "On the whole, the public health record of dried foods is remarkably clear. The almost complete absence of food poisoning or infection cases in which dried foods have been involved indicates that they are among the safest forms of food . . . While but little work has been done on the survival of pathogenic bacteria (in dried foods) the indications are that danger from this respect is remote." This does not mean that dried foods should be considered safe under all conditions, but it points

\* Presented before the Food and Nutrition Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 14, 1946

to the fact that, as a rule, they can be accepted with confidence.

Such statements show that, if bacteriological standards are to be set up, the primary emphasis should be from a sanitary or operating standpoint, and secondly, from the standpoint of public health. It can be shown throughout the food industry that the growth of spoilage bacteria is detrimental to the quality of the final product. So close is the correlation between spoilage and the deterioration of quality that bacterial standards should be a part of any quality standard of dried foods, since it is often possible to explain the reason for poor condition by a bacteriological examination. Bacteriological examinations of such products not only give evidence of conditions that existed during the manufacture but also point the way toward proper control of the processes. Fitzgerald<sup>2</sup> states that, "The problem of establishing factory sanitation methods and standards is as important as the question of quality standards. If products ever become public health hazards, then standards will be imposed on the industry . . . Sanitation standards are, nevertheless, a necessary adjunct of any quality control program. The very best grading standards can be nullified by poor sanitary techniques." Clague<sup>3</sup> points out that "The mere presence of bacteria, yeasts, or molds on dried foods does not of itself constitute a spoilage hazard. Modern packaging is such that moisture may be kept from gaining access to dried foods, thus eliminating the danger of spoilage. So the principal value of the microbiological examination of dehydrated foods would be to determine the comparative cleanliness of the process used from the time the raw product enters the factory until the finished product reaches the consumer."

It is evident that any bacterial standards must have their roots in the sanitary controls over food manufacturing processes. In order to be assured of any

uniformity of results from the microbiological standpoint there must be established as rigid a set of operating standards for plants that process foods as the standards established for the final products. This means that if bacterial standards are to be established for any food commodity there must also be established an accompanying set of suggested sanitary operating standards with which to meet these requirements. This does not necessarily mean plant supervision by an outside agency, but it does mean that some organized supervision in the plant is necessary in order to manufacture a high quality product. Good sanitary practice ought to come instinctively to a food handler, but, alas, it is found too infrequently and often only under the shadow of compulsion. Many public health control agencies find full-time employment in establishing good sanitary practices in places where it would seem natural to find them if for no other reason than the monetary return from efficiency. Sanborn<sup>4</sup> calls attention to the fact that " . . . First, food products prepared under unsanitary conditions are almost certain to contain filth, sometimes gross enough to affect flavor or appearance to the unaided eye, and always manifest to the microscopist. This may consist of mold or other microorganisms, insects or insect parts, rodent hairs or excreta—any or all of them," and further. "Bacteriology teaches that the heavier the initial infection, the more severe is the process requirement for sterilization. Infection at some insanitary point in the preparation line, therefore, may result in serious commercial spoilage or loss of quality due to more vigorous processing to overcome the heavier bacterial infestation." Many people have to learn the hard way that it costs money to be slipshod and unsanitary in food preparation.

Let us look at dried fruits, vegetables, eggs, and meat for a clearer picture of

the need for bacterial standards for such products. Some of the drying methods were developed before many of the principles of sanitation were established, and it is difficult to change them. Other methods have been developed with good sanitary practices in mind.

#### DRIED FRUITS

Dried fruits are contaminated with microorganisms when they leave the orchard, but they pick up additional infections as they are processed. Fortunately, as Nichols<sup>1</sup> points out, the high acid and low protein content of fruits make them unfavorable media for the growth of pathogenic bacteria. The infections are largely from yeasts and acid-tolerant spoilage bacteria. Phaff, et al.<sup>5</sup> describe the handling of prunes in drying and state that the water used in washing the prunes is recirculated over a long period of time and becomes heavily contaminated with microorganisms. This water may so heavily infect the prunes that washing with fresh water is insufficient to satisfactorily reduce the bacterial population. Other methods of operation may tend to further contaminate them. Even so, the use of germicides and dehydration yields a product with few live yeasts and molds. Mrak<sup>6</sup> discusses this phase of the drying problem and indicates that recontamination in handling after drying may result in considerable loss and undesirable changes in the fruit in storage. In some dried fruits gas fumigation may be used to control microorganisms. Whelton, et al.<sup>7</sup> elaborate on this phase.

The sun-drying of fruits has the disadvantage of bacterial contamination while fruit is exposed in the open without the killing effects of heat as found in mechanical dehydration. Moreover, certain fruits deteriorate when they are heated and sun-drying must be used. Except for accidental contamination by pathogens, dried fruits would seem to offer no public health hazard. Bacterial

standards should be concerned largely with control of handling and storage.

#### DRIED VEGETABLES

Vegetables are non-acid and, therefore, are subject to the growth of most types of microorganisms. Hucker, et al.<sup>8</sup> report a study of food processing plants from the microbiological standpoint. They found that although blanching and other operations reduce the numbers of microorganisms, recontamination in processing may occur. They found that the dried food from nine of twelve vegetable dehydrating plants was contaminated with members of the coliform group, and that "in 80 per cent of the cases, presumptive tests could be secured for coliform organisms on the finished dehydrated vegetable just prior to final packing." Jones<sup>9</sup> shows that *Escherichia coli* organisms are killed during proper blanching of vegetables. This points to the fact that if *E. coli* is found in the finished product it is indicative of contamination during the final processing and handling. A definite need for bacterial standards in such products is indicated, since the presence of organisms of the coliform group have long been used as an index of cleanliness. Their presence in dehydrated vegetables would indicate unsanitary or poor operating conditions. Kitner and DeLay<sup>10</sup> tabulate the improvement in bacterial quality obtained in a vegetable dehydrating plant through changes in the sanitary practices and in general plant conditions. He shows that sanitary conditions in operation during manufacture are definitely reflected in the final product.

Jones<sup>9</sup> points out that enormous quantities of air are used in dehydrating vegetables and that the amount of contamination encountered depends largely upon the location of the plant and the types of bacteria found in the air. Good sanitary practice would require the filtration of the air.

Jones further calls attention to the fact that high bacterial counts "not only lead to earlier spoilage upon rehydration of the products but they also suggest poor sanitary conditions and methods in the plant, and may lead to the rejection of the products by health authorities."

The overloading of dryer trays as reported by Vaughan and Kuneman<sup>11</sup> shows how bacteria may grow in the food during the actual dehydrating process, even to the point of souring before becoming dry. Light tray loading prevents this.

Kitner and DeLay,<sup>10</sup> Jones,<sup>9</sup> and Haines, et al.<sup>12</sup> point out that the viable bacterial counts of dehydrated vegetables decrease in storage. This shows that it is difficult to use the live count except as a control in actual plant operation. The direct microscopic examination of dehydrated products seems to be the only method which will reflect the general condition of handling and drying, and serve in establishing bacterial standards.

#### DRIED EGGS

The expansion of the dried egg industry has added these food products to many food commodities. More research work has been done on the bacteriology of these products than any other of the dried foods under discussion here. Liquid eggs constitute a splendid medium for the growth of bacteria. The sanitary quality of dried eggs is linked largely with the manner of handling the shell eggs and the liquid before it is dried. High bacteria counts in these products indicate poor operation or handling techniques. Not only is a product with an abnormally high bacterial count likely to be of poor edible quality but Stuart, et al.<sup>13</sup> have shown that egg powder of low sanitary quality does not hold up in storage.

The plate or viable bacterial count is not a true index of the bacterial quality

of an egg powder. Johns and Bernard<sup>14</sup> point out that the survival of bacteria in egg powder is affected by such factors as type of drier, drying temperatures, rate of cooling, and length of storage. Stuart, et al.<sup>15</sup> demonstrated that the death rate of bacteria in normal egg powder in storage was influenced by the initial moisture content. The lower the initial moisture the more rapid the death rate. Stuart, et al.<sup>16</sup> show further that in powder of high sanitary quality the rate of bacterial death proceeds at a uniform logarithmic rate, while there is a secondary accelerated death rate in powders of low sanitary quality. These facts, therefore, make it evident that the viable bacterial count can be of little value in establishing bacterial standards unless a complete history of the sample can be furnished.

However, the direct microscopic bacterial count, which shows the dead as well as the living bacteria in the powder, is not markedly affected by such factors. Thus, a microscopic examination will indicate through the type and numbers of bacteria the general conditions of the plant during the manufacturing period. Bartram<sup>17</sup> found that in experimentally prepared dried eggs the viable count was of limited value as an index of quality. Lepper, Bartram, and Hillig<sup>18</sup> show that the direct microscopic examination together with the chemical determination of the products of bacterial fermentation, acetic, formic, and lactic acids, serve to indicate the quality of the final product.

So far as is known, no authenticated cases of food poisoning or other infections have been traced to dried eggs. But the fact that several types of *Salmonella* have been isolated from dried eggs makes it necessary to keep the public health aspect in view when dealing with possible bacterial standards. The presence of *Salmonella* in dried eggs, and the fact that *Salmonella* poisoning outbreaks have not been reported pre-

sents an interesting public health problem. Soloway, et al.<sup>19</sup> have shown that *Salmonella* may be isolated from shell eggs, from the shell especially when dirty, from the egg liquid in an egg breaking room, and in egg powder. Soloway, et al.<sup>20</sup> report the isolation of *Salmonella* from 35 per cent of 5,198 samples of dried whole egg examined, and 52 *Salmonella* types were serologically identified from the isolations. Other workers, Gibbons, et al.<sup>21, 22</sup> and Schneider,<sup>23</sup> report isolations in varying amounts.

Although the types reported as occurring in egg powder with the greatest frequency are among those found in human and animal infections, outbreaks of *Salmonella* from eating dried egg products have not been reported. It is the opinion of the author that while the *Salmonella* types isolated are serologically identical with those found in food poisoning outbreaks, their pathogenicity may have been lost by some mechanism of passage through the hen as a host or through the selective action of the lysozyme, the natural germicide in the egg. The fact that outbreaks have not occurred should not preclude the presence of such bacteria. The contamination of egg powder with *Salmonella* from a human or rodent source might prove as infectious as it would in other foods.

It is evident that bacterial standards for dried egg products would serve to assure sanitary plant operations since poor operations would be reflected in high bacterial counts, and would serve to bring about constant checks for types of bacteria known to have public health significance.

#### DRIED MEAT

Dehydrated meat is one of the recent developments in the dried food field. As Ritchell, et al.<sup>24</sup> pointed out, comparatively little work has been done on the microbiology of this product as com-

pared with that done on the bacteriology of uncooked or cured meats. They demonstrated that dried meats of high viable bacterial count showed a rapid decrease in storage. With initial bacterial counts of approximately 21,000,000 per gm. only 510,000 remained alive at the end of 3 weeks, 3,000 at the end of 18 weeks, and 180 after 49 weeks. Experimental work carried out by Haines and Elliot<sup>12</sup> demonstrated that in order to prevent bacterial growth the meat should reach 52° C. (125° F.) within the first hour of dehydration and remain above that temperature until a fairly low moisture content is reached.

In the report of the work done in the U. S. Department of Agriculture on Meat Dehydration<sup>25</sup> a resumé of the "Control of Bacteria and Molds" in dried meat manufacture may be found. As stated in this report a large number of organisms were killed in pre-cooking of the raw material at 165° F. for 30 minutes. Bacterial spores were the predominating forms found in the dehydrated product. "On the basis of the experimental work, dehydrated meat was safe, from a bacteriological point of view, when produced in accordance with federal specifications for the products . . . dehydrated meats stored under conditions unfavorable for mold growth, as previously indicated, should offer no opportunity for contamination or growth of food poisoning bacteria. Reconstituted meat should be consumed promptly, since tests showed it is to be an excellent bacterial medium."

Dried meat with high bacterial counts would not only indicate poor sanitary conditions of manufacture, but also that the product would spoil quickly upon reconstitution. For purposes of plant control, indication of sanitary quality, and as a guide in use, the establishment of bacterial standards would be indicated. Here again it would be necessary to resort to direct microscopic methods



to develop the true picture of the conditions of manufacture.

The Committee on Foods (except milk) of the American Public Health Association<sup>26</sup> opened the question of establishing bacterial standards for dehydrated foods and pointed out that it would be necessary to determine what methods and standards could be applied to all classes of dehydrated foods. Jones<sup>9</sup> discussed, at some length the establishment of bacterial standards for dehydrated vegetables. He states, "The setting up of standards based upon the microbial content of dehydrated products presents considerable difficulty. It has previously been pointed out that a low bacteria count may be the result of storage at relatively high temperatures, e.g., room temperature . . . From the results presented in this paper it is apparent that a total count of not more than 100,000 bacteria per gram of blanched product may be readily achieved. Coliform bacteria should be absent in 1/200 gram product." He goes on to say that if coliforms are found in 1/20 gm., steps should be taken to check the processing. Haines and Elliot<sup>11</sup> suggested that a bacterial "production standard" might be set up for use in manufacture, and a "consumption standard" be used for utilization purposes. This would prove of value from a manufacturing standpoint but would not be practicable for checking samples of material offered for sale unless a complete history were at hand.

There is not enough information available upon which to base the limits of bacterial standards for all products. Additional research is needed and it should be directed toward determining the basis for reasonable standards. Since such standards would be used largely to determine the sanitary conditions of manufacture they should be determined by surveys of actual operation. It would seem that they should be a part of the standards of quality. No product should

be manufactured under conditions that would be revolting or detrimental to the consumer, and consumers of dehydrated foods are entitled to an assurance of the proper method of preparing the products. Jones<sup>9</sup> makes an excellent point that, "Plant sanitation deserves greater emphasis. Workers should have impressed upon them the fact that they are handling a food product and that personal hygiene and cleanliness are essential."

Although there is very little to indicate the presence of pathogenic microorganisms, which have retained their pathogenicity, in dehydrated foods, any bacterial standards should provide that the food is free of those organisms known to be pathogenic to man. This should also take into consideration those bacterial types generally used as indices of contamination, such as *E. coli*.

Reports in the literature and experience of actual operations indicate the need for bacterial standards for dried and dehydrated foods. Such standards should be on a reasonable basis and should take into consideration any variations which might be found to exist in normal operations with a good product. All such standards should be for voluntary application or for adoption as a code by the industry.

Perhaps the most useful standard would be that for bacterial count by the direct microscopic method. Certain modifications would be necessary before the method could be used for all products. Reasonable limits could be set, based upon conditions of reasonable plant operation, and these would reflect the sanitary quality of the dehydrated product just as other tests reflect the edible quality. It would then be necessary to establish standard methods of operation under which the bacterial standards could be met; otherwise, no uniformity of results could be expected. The lead in establishing and coördinating such standards should be taken by

such an organization as the Food and Nutrition Section of the American Public Health Association.

## REFERENCES

1. Nichols, Paul F. Public Health Aspects of Dried Foods. *A.J.P.H.*, 24, 11:1129, 1934.
2. Fitzgerald, Gerald A. Quality Grades are Essential for Frozen Food Packs. *Food Indust.*, 18, 6: 108 (June), 1946.
3. Clague, J. A. Microbiological Examination of Dried Foods. *Food Research*, 1, 1:45, 1936.
4. Sanborn, Ralph E. What Sanitation Means to the Processor. *Food Indust.* 18, 1:94 (Jan.), 1946.
5. Phaff, H. J., Mrak, E. M., Allenman, Ruth, and Whelton, Rita. Microbiology of Prunes During Handling and Drying. *Fruit Products J.*, 25, 5:140, 1946.
6. Mrak, E. M., Microbiological Deterioration in Dried and Dehydrated Fruits. *The Canner*, 100, 17: 22, 1945.
7. Whelton, Rita, Phaff, H. J., Mrak, E. M. Control of Microbiological Food Spoilage by Fumigation with Epoxides. *Food Indust.*, 18, 1:91 (Jan.), 1946.
8. Hucker, G. J., Pederson, C. S. and Brooks, R. F. The Sanitation of Food Plants. *Sixty-third Annual Report for the Year Ended June 30, 1944*, New York State Agricultural Experiment Station, Geneva, N. Y.
9. Jones, A. H. The Microbiological Aspects of Dehydrated Vegetables and Fruits. *Food in Canada*, 3, 7:16, 1943.
10. Kitner, J. H., and DeLay, P. D. Sanitation Aspects of Vegetable Dehydration Plants. *Army Vet. Bull.*, 37, 1:12, 1943.
11. Vaughan, R., and Kuneman, R. W. Microbiological Survey. *Fruit Products J.*, 24, 7:196, 1945.
12. Haines, R. B., Elliot, E. M. L. Some Bacteriological Aspects of Dehydrated Foods. *J. Hyg.*, 43, 6:307, 1944.
13. Stuart, L. S., Goresline, Harry E., Smart, Helen F., Dawson, Virginia T. Quality of Egg Powder Affects Rate of Change in Solubility. *Food Indus.*, 17, 2:154, 1945.
14. Johns, C. K., Bernard, H. L. Direct Microscopic Method in Bacteriological Control of Dried Whole Eggs. *Food Research*, 9, 5:396, 1944.
15. Stuart, L. S., Hall, H. H., Dicks, Edna E. Storage Changes in Spray-Dried Whole Egg Powder. *U. S. Egg & Poultry Mag.*, 48:629, 1942.
16. Stuart, L. S., Goresline, Harry E., Smart, Helen, Dawson, Virginia T. Effect of Storage Temperature on Bacteria in Egg Powder. *Food Indust.*, 17:1174, 1945.
17. Bartram, M. T. Bacteriological Changes During the Dehydration of Eggs. (Abstract). *J. Bact.*, 45, 1:38, 1943.
18. Lepper, Henry A., Bartram, M. T., Hillig, Fred. Detection of Decomposition in Liquid, Frozen and Dried Eggs. *J. Assoc. Off. Agr. Chem.*, 27, 1:204 (Feb.), 1944.
19. Soloway, M., Spaulding, E. H., Goresline, H. E. An Investigation of a Source and Mode of Entry of *Salmonella* Organisms in Spray-Dried Whole Egg Powder. *Food Research*, in press, 1946.
20. Soloway, M., McFarlane, Vernon H., Spaulding, E. H., Chemerda, Cecilia. Microbiology of Spray-Dried Whole Egg II Incidence and Types of *Salmonella*. *A.J.P.H.*, 37, 8:971 (Aug.), 1947.
21. Gibbons, N. E., Moore, R. L. Dried Whole Egg Powder, IX Occurrence and Distribution of *Salmonella* organisms in Canadian Powder. *Canad. J. Research*, 22, F:48, 1944.
22. Gibbons, N. E., Moore, R. L. Dried Egg Powder. XII The Effect of Drying, Storage and Cooking on the *Salmonella* Content. *Canad. J. Research*, 22, F:58, 1944.
23. Schneider, Morris D. Investigation of *Salmonella* Content of Powdered Whole Egg With Not More than Two Percent Moisture Content, II General Survey on Occurrence of Species of *Salmonella* in High-Quality Egg Powder. *Food Research*, 11, 4:313, 1946.
24. Ritchell, E. C., Piret, Edgar L., Halvorsen, H. O. Drying of Meat. *Indust. & Engin. Chem.*, 35, 11:1189 (Nov.), 1943.
25. United States Department of Agriculture, Meat Dehydration, *Circular 706*, 1944, p. 20.
26. Report of the Committee on Foods. Public Health Aspects of Dehydrated Foods. *A.J.P.H.*, 36, 3:248 (Mar.), 1946.

# The Problem of Reconstituted Milk\*

GEORGE H. HAUSER, M.D., AND WILLIAM H. KING

*Director, Division of Laboratories, Louisiana State Department of Health and City of New Orleans; and Chief, Food and Drug Section, Louisiana State Department of Health, New Orleans, La.*

RECONSTITUTED milk, the production and use of which have greatly increased in many parts of the world in recent years, is not of recent origin. Over seven centuries ago<sup>1</sup> the world's most famous traveler Marco Polo while visiting the Mongol Emperor Kublai Khan, realized the value of dried and reconstituted milk. These Mongols were nomads who required convenient food for their many expeditions. Quoting Polo, "they have milk dried into a kind of paste to carry with them. When they go on a journey, every man takes some 10 lbs. of this dried milk with him, and of a morning he will take half a pound of it and put it into his leather bottle, with as much water as he pleases, so as he rides along, the milk paste and the water get well churned together into a kind of pap, and that makes his dinner." There is some evidence that the ancient Egyptians may have used dried milk, but the interesting report made by Marco Polo is the first account of such a product.

Condensed milk has been manufactured for nearly 100 years and evaporated milk for more than 60 years; however, satisfactory processes for drying milk have been developed only within the present century. Today powdered milk is used throughout the world, but this valuable commodity is of comparatively recent commercial origin.

Due to the shortage of fresh fluid milk in certain areas of this country, particularly in the South, there has been a trend toward extending local supplies of fluid milk by reconstituting milk products back to the approximate chemical composition of fluid milk with water. This was particularly true in those areas where the population was abnormally increased due to the influx of military and defense plant personnel. All indications are that the use of reconstituted milk and cream will continue.

A number of ingredients may be used for reconstituting milk; these are listed herewith: (1) skim milk powder with fresh cream, (2) skim milk powder with butter, (3) plain condensed skim milk and natural cream, (4) plain condensed milk with unsalted butter, (5) whole evaporated milk, (6) combinations of any of the above, either with water or with natural fluid milk. By far, the most common materials used for reconstituting milk in the State of Louisiana are concentrated skim milk with natural cream, with or without natural fluid milk. The State Health Department has information, however, that in some instances powdered milk may be used. Some of the milk is sold in bottles bearing caps labeled "reconstituted milk," while other reconstituted milk has been mixed with fresh fluid milk and sold in bottles labeled simply as "milk."

The Public Health "Milk Ordinance and Code,"<sup>2</sup> recommended by the

\* Presented before the Laboratory Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 14, 1946.

U. S. Public Health Service, defines reconstituted or recombined milk or cream as follows:

Reconstituted or recombined milk is a product resulting from the recombining of milk constituents with water, and which complies with the standards for milk fat and solids not fat of milk as defined herein. Reconstituted cream or recombined cream is a product resulting from the combination of dried cream, butter, or butter fat with cream, milk, skim milk, or water.

The Louisiana State Sanitary Code<sup>3</sup> defines reconstituted or recombined milk or cream as follows:

Reconstituted or recombined milk is a product resulting from the recombining of milk constituents with fluid milk or water and which complies with the standards for milk, milk fat and solids not fat of milk as defined herein. Reconstituted or recombined cream is a product resulting from the combination of dried cream, butter, or butter fat, with cream, milk, skim milk, or water and which complies with the standards for cream as defined herein.

Both of these codes further require that all bottles, cans, packages, and other containers enclosing milk or any milk product defined in the code shall be plainly labeled with the name of the contents as given in the definition of the code. In other words, these codes recognize reconstituted milk and cream as food products which may be sold if properly labeled, and of course if they are not otherwise adulterated or misbranded.

On July 15, 1946, Act 159, enacted by the Legislature of the State of Louisiana, was signed by the Governor. This is an Act designed to protect the public health and safety, and requires all fluid cream and milk or other milk products which may be converted into fluid milk or fluid cream, shipped or transported into Louisiana, to be of the standard required by Standard Ordinance and Code of the U. S. Public Health Service and by the Sanitary Code of the Louisiana State Board of Health.

This act also provides for inspection of milk produced for shipment or transportation into this state and the conditions under which it is produced, and provides for the issuance of permits to shippers or transporters by the Louisiana State Board of Health. The Louisiana State Sanitary Code outlines the sanitary conditions under which such fluid milk must be produced. At present, regulations are being prepared governing the sanitary conditions under which milk must be produced to be used in manufacturing milk products, including the various concentrated and dried milk products.

During World War II the armed forces purchased, for use by military personnel, large quantities of concentrated milk products for shipment to areas in this country and abroad where there was a shortage of safe fluid milk. Accordingly, the Quartermaster Corps of the U. S. Army<sup>4</sup> issued tentative specifications for non-fat and whole dried milk solids as well as concentrated whole and skim milk to be used in making reconstituted milk. Specifications were also issued by the Quartermaster Corps for pasteurized milk blended with reconstituted dried whole milk. The specifications included bacterial, chemical, sediment tests, and sanitary standards, not only for the products referred to above, but also for the raw milk used in their manufacture.

The American Dry Milk Institute, Inc. *Bulletin No. 906*<sup>5</sup> has set up sanitary and quality standards for the dried milk industry, which involve farm sanitation and quality of milk supply, equipment and plant sanitation, handling and drying methods, analysis and grading of the finished products, and packaging requirements. In addition, the Institute published *Bulletin No. 911*,<sup>6</sup> setting forth the standards for various grades of dried milk products including chemical and physical properties, bacterial count, and sediment. It

states that it is generally agreed that the bacterial count of non-fat dry milk solids is not necessarily an indication of the quality of the raw milk from which the dry product is made. The process of manufacture has a direct bearing upon the extent to which bacteria are destroyed.

In July, 1946, a letter was written to the health officer of each state requesting information regarding regulations and standards, including bacteriological and chemical tests for reconstituted milk. Forty-two replies were received and classified as shown in Table 1.

As noted in Table 1, in eight states the sale of reconstituted milk is prohibited by law, but one of these allowed it to be sold only during the war emergency.

Seven states permit sale under the Standard Milk Ordinance and Code recommended by the U. S. Public Health Service. One of these states accepts it only on the basis of the quality of the raw milk, and two require that reconstituted milk meet bacteriological standards, but these standards were not defined.

In five states it is permitted in those communities which have adopted the Standard Milk Ordinance and Code.

Thirteen states have special laws or regulations pertaining to its sale and distribution. Most of these require that it meet the minimum chemical composition of fluid milk with respect to butter fat and non-fat-solids content, and must be properly labeled. One state controls it indirectly in that all fluid milk must be produced on dairy farms within the natural milk shed which has been inspected and approved by the Dairy and Food Commission. One southern state allows its sale on an emergency permit basis. This permit is issued by the state board of health on recommendation of the county health officer if the local fluid milk supply is short. It requires

pasteurization before concentrating and during recombination, and sets a maximum standard plate count of 30,000 per ml. after pasteurization. It provides sanitary, bacteriological, and chemical standards for ingredients used in the reconstitution, including the concentrated milk ingredient, fresh whole milk, water, and plants set up for the purposes of both dehydration and rehydration.

The director of the dairy and food division of the department of agriculture of one of our northern dairy states asserted that because of the high temperature dried products are subjected to, it does not seem that these products would involve a major problem with respect to health hazards. The process or act of reconstituting milk would be the main problem, including among other things, the sanitary quality of the water used. In addition to the chemical standards for dried milk products, that state requires a standard plate count not greater than 50,000 per ml. on a reconstituted basis when the milk is reconstituted with sterile water.

Seven states have no laws or regulations governing its sale and distribution, and two of these stated that none is sold within the state.

Information received from two states was unsatisfactory for classification purposes.

The increased use of reconstituted milk by military personnel prompted Randall<sup>7</sup> to investigate it from bacteriological, chemical, and biological standpoints. At the time, these studies were carried on, Randall was a Major, Veterinary Corps, United States Army, stationed in Manila, Philippine Islands.

The product used was a reconstituted milk prepared from skim milk powder shipped from California and butter from Australia to which was added water obtained from an artesian well. It was pasteurized during the reconstituting process and bottled in the usual manner for pasteurized whole milk.

Randall made bacterial and Breed counts of the skim milk powder, butter, water, and the finished product at monthly intervals. He found the bacterial plate colony count of the butter and water consistently low, while that of the skim milk powder was high. The Breed count of the skim milk powder was excessively high, indicating a probable high bacterial content of the fluid skim milk used for drying. Both the bacterial plate colony and Breed counts in the finished product were well within the prescribed limitations for Grade A pasteurized milk.

Chemical examinations of two samples of milk powder which had been stored for 5 months showed a moderate darkening of color, a decreased solubility, and a faint musty odor, but no suggestion of tallowy odor. The Kreiss test for oxidation of fat was negative, and the total solid content, including fat, of the reconstituted milk met standard requirements.

In the biological experiments conducted on rats, the vitamin content of the reconstituted milk was not appreciably changed by the reconstituting process.

Randall concluded from this experimental work, that a fluid milk can be prepared from skim milk powder, sweet (unsalted) butter, and water, that will closely approximate pasteurized cow's milk.

Tice, Tisdall, and McCreary<sup>8</sup> devised a method of supplying reconstituted milk for drinking purposes to the Royal Canadian Air Forces personnel in isolated stations. This consisted in the use of gas-packed whole drug milk which was thoroughly reconstituted by means of an electric mixer, strained, and aged in a refrigerator for 24 hours before serving ice cold. They reported the aging process greatly improved the taste of the milk.

Curtis and Hileman<sup>9</sup> in a study of the comparison of media and incubation

temperatures for making bacterial counts of spray process dry skim milk have shown that the use of tryptone agar with incubation at 32° C. (89.6° F.) for 48 hrs. as compared with the standard method using standard agar and incubated at 37° C. (98.6° F.) resulted in a 94 per cent increased plate count. The tryptone agar showed a marked increase over that obtained by the use of standard agar 51.9 per cent at 37° C. and 87.4 per cent at 32° C. while the reduction in the incubation temperature resulted in a similar but somewhat lesser effect—standard agar 3.5 per cent—tryptone agar 27.7 per cent.

Crossley and Johnson<sup>10</sup> reported the bacteriological aspects of the manufacture of spray dried milk and whey powders. The bacteriological count of the final powder showed great variations and was affected by many factors, such as, the initial bacterial content of the milk, types of organisms initially in the milk, pasteurization variations, and plant cleanliness. Various types of bacteria were found. Coliform organisms were usually present but almost always in small numbers, mainly of the aerogenes type. It was also found that 48.5 per cent of the coliform strains were heat resistant as compared with 2.2 per cent of the raw milk strains. Plant contamination by heat resistant strain was an important factor. While the actual spray-drying destroyed many bacteria, some non-thermoduric species survived, and it could not be relied upon to kill pathogenic bacteria; hence the need of reliable pasteurization. During storage of the dried milk there was a considerable but variable decline in the number of bacteria, with rapid disappearance of the coliform type.

Dr. Robert S. Breed,<sup>11</sup> Chairman of the Committee on Standard Methods for the Examination of Dairy Products, of the American Public Health Association, recently made the following pertinent statement:

Fresh milk properly pasteurized is naturally to be preferred to any reconstituted milk; but the use of milk is so important from the standpoint of nutrition that there is, in my judgment, every reason to extend the use of reconstituted milk, evaporated or other type of dehydrated milks in areas where milk supplies are not sufficiently abundant to be used generally. The development of the dehydrated, evaporated, and condensed milk industry in the United States has resulted in a much larger per capita use of dairy products than would otherwise have taken place, and the nutrition of our children has been greatly benefited. Such products can normally be put on the market at prices that make them available to the general mass of the people. Experience has shown that the danger of the spread of infectious disease by the use of dehydrated or canned milk products is practically nonexistent.

Recently, however, Allen and Baer<sup>12</sup> have reported an outbreak of septic sore throat due to reconstituted milk. The outbreak was caused by milk from a "mechanical cow." The reconstituted milk was prepared from powdered dry milk, sweet cream, unsalted butter, and water. Beta hemolytic streptococcus was the causative organism.

When both fresh whole and dry whole milk are figured to the dry basis for comparison, using data prepared in *Tables of Food Composition in Terms of Eleven Nutrients*,<sup>13</sup> there is noted little chemical difference in the two products.

Nevens and Shaw<sup>14</sup> studied, in feeding tests with albino rats, the apparent digestibilities of the total protein, fat, sugar, and total solids of fresh whole milk, spray process powdered whole milk, and roller process powdered whole milk. No significant differences in the apparent digestibility of the two kinds of powdered milk were found.

The apparent digestibility of the protein of fresh whole milk was significantly higher than that of powdered whole milk. The fat of both fresh whole milk and powdered whole milk was found to be about 99 per cent digestible, while

the sugar of both kinds of milk was completely digestible.

The detection of reconstituted milk and cream is difficult, as the tests presently used have not proved conclusive. The possible destruction of part of the vitamin content, the extent of which depends upon methods used for concentrating the raw milk product, and reconstituting, is not sufficient to serve as a basis for characterizing milk as having been reconstituted. Perhaps most significant are the properties of the precipitated curd with adherence of part of the natural lactose to the curd in such a way that it cannot be readily washed out. The latter is stated to be the basis for the Evenson test.<sup>15</sup> Some slight differences have been reported in the protein constituents of milk caused by concentration, but these are not considered sufficient for detecting the presence of reconstituted milk in fluid milk.

Although milk can be reconstituted in such a way as to comply with the usual chemical and physical tests for added water in fluid whole milk, it may show the presence of added water when analyzed by the usual methods for determining added water in fluid milk, if it is not properly reconstituted.

W. H. King has been appointed associate referee in the Association of Official Agricultural Chemists, to study the chemistry of reconstituted milk, particularly with reference to chemical tests. In his first report, at the October, 1946, meeting of the Association at Washington, D. C., he stated that there is need for improvement in methods which have been used to detect the presence of reconstituted milk by objective chemical tests. Further investigation is planned of present tests and other chemical approaches to the problem.

It appears that the use of reconstituted milk will be largely confined to those tropical or sub-tropical areas where the local supply of fluid milk does not meet the demand. This is not only

TABLE 1

*State Regulations Governing Sale of Reconstituted Milk*

<i>Illegal</i>	<i>U.S.P.H.S. Milk Ordinance and Code</i>	<i>State Enforcement through Local Ordinances</i>	<i>State Milk Ordinance</i>	<i>No State Regulations</i>	<i>Unclassified</i>
California	Colorado	N. Dakota	Alabama	Delaware	Missouri
Florida	Georgia	S. Dakota	Connecticut	Indiana	Oregon
Massachusetts	Kentucky	Texas	Idaho	Iowa	
Michigan	Nevada	Virginia	Illinois	New Jersey	
New York	S. Carolina	Washington	Louisiana	New Hampshire	
Ohio	Tennessee		Maine	Pennsylvania	
Rhode Island	W. Virginia		Maryland	Utah	
Wisconsin			Minnesota		
			Mississippi		
			Nebraska		
			New Mexico		
			Vermont		
			Wyoming		

true of some of the southern states of the United States but applies also to certain foreign countries.

At the present time, several southern cities are using reconstituted milk as an adjunct to their fluid milk supply. Plans are being formulated by the Department of Agriculture to try out reconstituted milk prepared from powdered milk in 16 schools—4 each in Louisiana, Mississippi, Georgia, and South Carolina. The reconstituted milk will be used not only in the preparation of cooked dishes, but converted into a beverage that looks exactly like bottled milk. The experiment will be closely watched and records kept of which dishes the children liked best, and how well they drink the dry-milk-and water beverage.

Mexico City has just started the use of reconstituted milk on a large basis. The dry milk is obtained from manufacturers in the United States, reconstituted and pasteurized in Mexico City and distributed in wax paper containers.

## SUMMARY

The legal, bacteriological, sanitary, chemical, nutritional, and analytical aspects of reconstituted milk are presented.

Information received from 42 states covering regulations governing the sale of reconstituted milk show great variation, as given in Table 1.

It seems apparent that the use of reconstituted milk, to supplement natural fluid milk, is increasing in various parts of the world.

The study of reconstituted milk should be continued, particularly with the view of establishing bacteriological, chemical, biological, and sanitary standards for this product.

## REFERENCES

1. Tobey, James A. Powdered Milk, *Hygeia*, 11: 140-142 (Feb.), 1933.
2. Milk Ordinance and Code. *Pub. Health Bull.*, 220:22 (pp. H.), 1939
3. Louisiana State Board of Health. *Louisiana State Sanitary Code*. Rev. Ed., 1946.
4. U.S. Army Bulletin, Quartermaster Corps (Tentative Specifications) Milk, Dry, Whole and Non-fat Solids. CQD-135A, 136, 137A, 166A, 344, 1943-1945.
5. American Dry Milk Institute. Sanitary and Quality Standards for the Dry Milk Industry. *Bull.* 906 (May), 1944.
6. American Dry Milk Institute. The Grading of Nonfat Dry Milk Solids. *Bull.* 911 (Mar.), 1944.
7. Randall, Raymond. Bacteriological, Chemical and Biological Studies of Reconstituted Milk. *Philippine J. Sc.*, 52, 3:219-233 (Nov.), 1933.
8. Tice, J. W., Tisdall, F. F., and McCrery, J. F. A Practical Method For the Supply of Fresh Milk to Isolated R.C.A.F. Stations. *Canad. M. A. J.*, 51:541-543 (Dec.), 1944.
9. Curtis, L. B., and Hileman, J. L. A Comparison of Media and Incubation Temperature for Making Bacteria Counts of Spray-Process Dry Skim Milk. *Food Research*, 2, 1:73-79, 1937.
10. Crossley, E. L., and Johnson, W. A. Bacteriological Aspects of the Manufacture of Spray-Dried Milk and Whey Powders, including some observations Concerning Moisture Control and Solubility. *J. Dairy Research*, 13, 1:5-44 (Sept.), 1942.
11. Breed, Robert S. Personal Communication, 1946.
12. Allen, Ralph F., and Barr, Louis, S. Outbreak of Septic Sore Throat Due to Reconstituted Powdered Milk. *J.A.M.A.*, 124, 17:1191-1193 (Apr.), 1944.



13. U.S. Department of Agriculture, Department of Human Nutrition and Home Economics. *Tables of Food Composition in Terms of Eleven Nutrients*, 1945.

14. Nevens, W. B., and Shaw, D. D. The Effect of Dairy Manufacturing Processes Upon the Nutritive Value of Milk. *J. Nutrition*, 6:139-149, 1933.

15. Evenson, O. L. *J. Dairy Sci.*, 97-5, 1922.

## What Is a Public Health Engineer or a Sanitarian?

That question is answered for New York State by a recent addition to Chapter XI, "Qualifications for Public Health Personnel," of the New York State Sanitary Code. The recent addition is known as "Section G" and is entitled, "Public Health Engineers, Sanitarians, Sanitary Inspectors."

The public health engineer is described as that individual with professional training and experience in engineering, plus specialized training in the application of his engineering knowledge and skills to public health.

The sanitarian is listed as the person who, through training and experience, is qualified for membership in a scientific profession and with specialized training in methods and techniques utilized for the protection and promotion of the public health through control of the environment. "Activities related to the control of milk, food, or other phases

of environmental sanitation not involving public health engineering" are given as examples of duties.

The sanitary inspector is classified as the subprofessional individual.

The Code Amendment goes on to require all appointing authorities to employ only those public health engineers, sanitarians, or sanitary inspectors who can show satisfactory evidence of possessing the minimum requirements as established by the Amendment. Five grades of engineers are outlined, giving typical duties and required training and experience necessary for each grade. Three grades of sanitarians are described in a similar manner. There is only one grade of sanitary inspector provided for.

The Amendment referred to above appears in a *Health News Supplement* for June 30, 1947 published by the New York State Department of Health, Albany.

# Safe and Beneficial Utilization of Nuclear Energy\*

ANDREW H. DOWDY, M.D.

*Professor of Radiology, School of Medicine and Dentistry, University of Rochester, Rochester, N. Y.*

THE last half century has seen more scientific advances than any similar period in the history of civilization. Acceleration of discoveries and inventions, and their application to applied science have been most noticeable in the past fourteen years. There is a variable but unavoidable lag phase between the acquisition of any new scientific fact and its application to a practical use. The shorter this lag phase the more rapidly will civilization progress. Scientists in coöperation with industry have an unprecedented opportunity to develop the safe production and utilization of nuclear energy for peacetime uses. One can scarcely conceive of a basic science which is not essential to the full realization of this objective. The medical profession and the specialty of industrial hygiene are destined to play important roles.

It is human nature to emphasize the dangers of recently developed powerful agents and to lose sight of their probable usefulness. It is not unlikely that prehistoric man was introduced to fire as a naturally occurring result of lightning having ignited some object or objects in his environment. His immediate concept of fire, doubtless, was that of a most dangerous and destructive agent. The first ingenious and courageous man who was able artificially to produce and control fire must indeed have gained

both the envy and the distrust of both friend and foe. With the advance of civilization, fire has remained an ever potential hazard. Yet its beneficial uses have been so developed and utilized that at present it is one of the essential agents of modern civilization. The evolution of controlled nuclear energy can and must bring this new source of power to a similar esteem in the eyes of the civilized world.

With the discovery of nuclear fission and the production of nuclear energy on a large scale, the old hypothesis that matter is indestructible is no longer tenable. It is possible to convert mass into energy and the latter may be dissipated in the performance of useful work or at a complete loss into the surrounding atmosphere. Einstein's equation  $E=mc^2$  where  $E$  represents energy in ergs,  $m$  denotes mass in grams, and  $c$  equals the speed of light in centimeters per second, represents the energy possible were there a complete conversion of mass into energy. One must hasten to emphasize that such a complete conversion of any particular mass is impossible even with uranium 235 or plutonium. It is possible to convert only a very small per cent of the mass of these substances into energy. In the case of uranium 235 the ratio of mass lost by fission to the original mass is approximately one-tenth of one per cent. The best known yield of conversion of mass into energy is in the sun where it is approximately one per cent. This does not mean that there is not an enormous

\* Presented before the Industrial Hygiene and Public Health Nursing Sections of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 13, 1946

amount of power made available by the conversion of mass into energy. One kilogram of uranium 235 in undergoing fission loses one gram of mass and releases 25,000,000 kilowatt hours of energy.

While there is a vast quantity of potential nuclear energy, which may be released from a naturally abundant metal such as uranium, there are certain aspects relative to its production on a commercial basis which at the present prohibits its competition with the energies derived from the combustion of oil, gas, and coal. This does not mean that in the near future the situation may not be reversed. There are many scientific purposes to which the products of controlled nuclear energy are being put at this time. We are concerned with the hazards of production of nuclear energy and the immediate utilization of its products.

#### RADIATION HAZARDS OF PRODUCTION

Uranium occurs in nature admixed with small amounts of radium. During the separation and purification of the crude uranium ore there is a possible human exposure to external radiation from alpha and beta particles and gamma rays. Radiation may arise from an external or internal source. The latter results from radioactive dusts, gases, or solutions which have gained access to the interior of the body through absorption by the skin, the lungs, or the gastrointestinal tract.

The neutron is a type of radiant energy particulate in character, neutral in charge, and derived from the nucleus of the uranium 235 atom when it undergoes fission. During the process of fission the uranium atom breaks into two fragments known as fission fragments. These vary in size, chemical composition and degree of radioactivity: some are gases, others solids. In general, those in the ascendancy have approximately one-half the atomic weight of the original uran-

ium 235 atom. A neutron from a uranium 235 atom undergoing fission may be captured by an atom of uranium 238 which in turn transmutes into the radioactive element plutonium. Many other elements contained in the pile as impurities may likewise capture a neutron and transmute into radioactive isotopes. From this it is seen that two different types of radioactive isotopes are formed in the pile, one by fission of uranium 235, and the other by neutron capture. Neutron capture also may give rise to the release of radiant energy in the form of gamma rays. The isotopes, formed as a by-product of the pile, may emit beta particles, gamma rays, or both. The pile thus becomes a radiating source for large amounts of potentially dangerous radiant energy.

Gamma rays and neutrons are important as the primary hazards from external radiation. Both are extremely penetrating and capable of producing profound and harmful biological changes. Injury may result from external beta radiation in which damage is usually confined to the skin. It is doubtful if external radiation from alpha particles presents any hazard because of their poor penetrating ability, most of them being stopped by the clothing or the superficial layers of the skin.

Alpha, beta, and gamma radiations may result in serious damage once their parent source gains access to the interior of the body (internal radiation), through skin absorption, inhalation, or ingestion. The resultant injury is largely independent of the route of entry but directly dependent upon the type or character of the radioactive material, its distribution within the body, its storage, its rate of excretion, its half-life, and the amount of material involved. The toxicity of uranium *per se*, because of its low radioactivity, is chemical in nature and will be discussed later. The reverse is true of radium and the many radioactive fission products and isotopes.

Radium stored in the body can be detected by the presence of its gaseous decay product, radon. The presence of radium within the body in no way alters or changes its rate of decay. The gaseous radon establishes an equilibrium with the amount of radium contained within the body and is partially absorbed by the circulating blood and carried to the lungs where it is liberated with the expired air. A measurement of the amount of radon in the expired air of an individual is an index of the amount of radium contained in the body of that individual. The amount of radium which can be tolerated in the body because of its low rate of excretion, its high degree of radioactivity, and its long half-life (1590 years), is extremely small and has been considered to be not more than one-tenth (0.1) of a microgram.

All living cells whether of man, animal, or plant, are capable of injury from these various types of radiant energy. The extent, location, and type of injury which may be sustained, are dependent upon the kind of radiation under consideration, its physical properties, mode of application (whether external or internal), intensity, duration of exposure, and the character and function of the cells of the species of animal or plant being subjected to irradiation. In other words, the degree and character of the biological changes resulting from irradiation are dependent upon many complicating factors and often subject to difficulties of interpretation.

Many important contributions to radiation biology have been made by the various laboratory groups working on the health protection aspects of the atomic bomb. These findings are now being evaluated and written for publication in the not too distant future. The *modus operandi* of irradiation upon biological tissue and body systems is not thoroughly understood and requires much additional study. When this mechanism is known, we will probably have a much better

understanding of the mysteries of life.

In man the most sensitive tissues are the reproductive cells of the generative and hematopoietic systems. These are the systems which will be first noticeably effected by chronic exposure to suitable types of radiation. In certain types of laboratory animals, namely, mice and fruit flies, the genetic mechanism is known to be susceptible to damage at relatively low dosages. In each instance the probability of an injury, and its degree, is dependent upon the character of the radiant energy, its intensity and duration, and the frequency of exposure. The reproductive function may be temporarily decreased, interrupted, or permanent sterility may ensue. The circulating leucocytes and erythrocytes may be unaffected, slightly decreased, or depleted. As the degree of injury on the hematopoietic system increases, a profound leucopenia may result followed by a reduction in the number of platelets and red blood cells with a concomitant fall in the hemoglobin. Should the amount of the irradiation be sufficient, the animal or individual may manifest cutaneous, subcutaneous and internal hemorrhages with bleeding from the body orifices. These latter indicate extensive injury and the individual may succumb from secondary infection. The bone marrow and lymph nodes in such instances may reveal almost complete destruction. Such a disastrous result may eventuate from repeated chronic irradiation or from a single exposure as experienced by the people of Hiroshima and Nagasaki and the test animals at Bikini. It is not improbable that animals and humans thus exposed but not succumbing may at a future date show an increased incidence of leukemia as compared with an unirradiated but otherwise comparable group.

CHEMICAL HAZARDS OF PRODUCTION  
Chemical hazards are present during

certain phases of the production of nuclear energy. Here we are principally concerned with the toxicity of uranium and its multiplicity of compounds including the fluorides. Although uranium is a weakly radioactive substance (alpha emitter), this particular property as such is of no practical importance as a radiation hazard in comparison with its chemical toxicity. Its detection in body excreta, therefore, generally depends upon its chemical rather than upon its radioactive properties. One of the first problems of the health groups was to develop a reliable quantitative method for its detection in very small amounts. A method was developed which enables one to measure accurately one part in 10,000,000 in animal tissue, blood, or urine. Its presence can be detected in much smaller amounts,  $1/2,000,000,000$  of a gram.

To a limited degree, the toxicity of uranium varies with the solubility of the compounds. The various compounds may be encountered in the form of particulate dusts or gases. Protection against chemically toxic dusts and gases is an old problem to industrial engineers, toxicologists, and industrial hygienists. Protection consists in completely closed systems where possible, adequate circulation systems to evacuate the deleterious agents from the atmosphere, gas masks, and special procedures for laundering the work clothing of plant workers. Personnel hygiene and rigid medical supervision to detect small amounts of noxious substances in excreta are important features of adequate health protection. Such a program requires that industrial physicians be conversant with the clinical abnormalities likely to result from undue exposure to the chemical involved. The production of the atomic bomb and the peacetime utilization of nuclear energy and its products have and will require the utmost in coöperation between industry, industrial hygienists, radiobiol-

ogists, toxicologists, and scientists in general.

The toxicology of uranium and its various compounds has been the subject of a very thorough and careful investigation. It is doubtful that any other industrially hazardous chemical has had a comparable investigation in such a brief time. The results of these studies carried on by the several medical groups are being assembled for publication. It is sufficient to state at this time that many of the uranium compounds may be absorbed into the body through the skin, by way of the lungs, or from the gastrointestinal tract by ingestion. Uranium *per se* is primarily a nephrotoxic substance and is principally excreted through the kidneys.

Despite the urgencies of war, the operation of the Manhattan Project resulted in an enviable safety record for the undertaking as a whole. The hazards which have been enumerated can be circumvented. In the conversion of this new industry to peacetime pursuits, there must be no relaxation of protective measures.

#### THE BENEFITS OF NUCLEAR ENERGY AND ITS PRODUCTS

The possible benefits to be derived from the peacetime utilization of nuclear energy and its products present to the scientists a situation almost comparable to a Utopia. Certainly 20 years ago, today's scientific and pseudo-scientific thoughts would have been classed as the dreams of a madman, to wit, stratosphere rockets, man-made meteorites, or possibly a celestial body, radio-controlled, nucleo-powered cargo planes, uranium powered ocean going ships capable of crossing and recrossing the ocean on the energy derived from the conversion of one gram of mass to energy.

Various multi-million dollar regional experimental laboratories are being established for further research on development and utilization of nuclear energy.

Large-scale projects range from stationary power plants to mobile plants for the propulsion of battleships and submarines. The not too distant future of these projects would seem to be hopeful.

The products of nuclear energy for peacetime purposes have been available since late summer of 1946. To stimulate and encourage fundamental research in medicine, biology, chemistry, physics, and other sciences, the Manhattan District at Oak Ridge, Tenn., developed a program for the production and distribution of radioactive isotopes on a national scale. The first eleven months following V-J Day were spent in the conversion of the pile to isotope production, procuring of personnel, and the setting up of an organization for the equitable distribution of the isotopes. Major General Groves appointed an Interim Advisory Committee on Isotope Distribution Policy and two advisory subcommittees, one on Allocation and Distribution, and one on Human Applications. The advisory committees were to operate in conjunction with Dr. Paul Aebersold, Chief, Isotopes Branch, Research Division, U. S. Engineer Office, Manhattan District, Oak Ridge, Tenn.

The success of this program may be measured by the following accomplishments. More than 50 radioactive isotopes are being produced by the uranium pile through neutron irradiation and fission processes for national distribution. Between July 1 and September 30 of this year more than 150 applications for isotopes have been received and processed. The vast majority of these applications have been approved. Thirty-eight or more of the requests have been for C 14. Within the coming year it is anticipated that the production of C 14 will be sufficient to supply the needs of most research workers presenting worthwhile problems. It seems likely that the limiting factor in distribution in the near future may well be the lack of in-

struments and well trained personnel for the utilization of the available isotopes.

Prior to the war many of these isotopes were known and made in small quantities by cyclotrons. While the quantities available by cyclotron production were relatively small and limited in experimental utilization to a few centers, sufficient information has been obtained to establish their importance as an investigative tool and possible therapeutic agent.

A note of warning should be sounded in reference to the value of these radioactive isotopes as therapeutic agents. The *most important* and *immediate* value will be as an investigative tool. This does not mean that important therapeutic uses will not and are not being made of certain radioactive isotopes at the present, but the public must not expect them to furnish an *immediate* cure for cancer. Many secrets remain to be pried from the isolated cell and the organism as a whole relative to their metabolism and physiology under normal and pathological states. The attack on cancer, therefore, must be both a direct and indirect one.

The radioactive isotope C 14 seems likely to become one of the most important that will be utilized as a tool. Carbon is the one element which is common to all organic compounds. Carbon, hydrogen, and oxygen, plus chlorophyll and the sun's rays are responsible for a vast source of energy in the form of carbohydrates. Under the conditions of extreme heat and pressure that exist in the sun, hydrogen is converted into helium with the liberation of tremendous amounts of energy. It seems likely that C 14 and H 3 have an obvious destiny in the hands of well trained scientists in helping to reveal many of nature's secrets. There are many other radioactive isotopes which are or will prove important but time and space permit the mentioning of only a very few, such

as, sulfur, iodine, potassium, hydrogen, iron, arsenic, sodium, and phosphorus.

Should no advantage other than the quantity production of a large number of isotopes accrue from the Manhattan Project, the expenditure of \$2,000,000,000 will eventually be repaid many times over in the years to come from increased commercial production and better health to the nation.

A great deal of fundamental investigation by various groups in the country has been done with radioactive iron to study anemic states and the formation of hemoglobin, and the body's reserve of iron. The body needs for potassium and sodium have been studied by the use of radioactive isotopes of these elements. Radioactive phosphorus is potentially a useful agent for the treatment of polycythemia and the leukemias. Radioactive iodine seems promising in the treatment of selected cases of hyperthyroidism and a certain small percentage of cancers of the thyroid. The general public must be neither over-optimistic nor pessimistic but should be hopeful. It will require some time before the efficacy of radioactive iodine for the treatment of hyperthyroidism can be evaluated in comparison with the surgical care of such cases. Its use in certain types of cancer of the thyroid would seem to be more rational for the treatment of malignancy than is the use of phosphorus in leukemias. But again, it must be emphasized that cancer of the thyroid is infrequent in comparison with cancer in general, and of the total thyroid cancers only a very small per cent retain the ability to absorb and retain sufficient amounts of radio-

active iodine to be of therapeutic value.

Without a doubt many scientists in the next few years will strive to find or synthesize chemicals having a toxicity for certain cancer cells and a high predilection of absorption by these same cells in contrast to the cells of the normal body tissues. Should such a compound be discovered the next logical step would be to select a radioactive isotope having the proper half-life and energy values and synthesize it into the compound. By so doing the cancer could be attacked both by a chemical toxin and an internal radiation limited primarily to the site or sites involved by the cancer tissue. Such a possibility is not an idle dream but its realization may be delayed.

The real solution for the cancer problem does not lie in its surgical and radiation treatment. It lies rather in discovering the fundamental principle or principles wherein a healthy cell escapes its normal growth restraints and disregards its function as a serviceable unit of an organized whole.

#### SUMMARY

We have briefly reviewed the possible dangers in what is potentially the most hazardous industrial process known to man. It has been pointed out that the hazards were circumvented during the wartime. There can and must be a safe peacetime production and utilization. The commercial and scientific benefits are multitudinous. The program for the national distribution of radioactive isotopes is well under way and from this single feature alone will come many new scientific facts which will be of inestimable benefit to us all.

# The American Academy of Pediatrics Study of Child Health Services: Results to Date\*

KATHERINE BAIN, M.D., JOHN P. HUBBARD, M.D., AND  
CHARLES L. WILLIAMS, JR., M.D., M.P.H.

*Director, Division of Research in Child Development, U. S. Children's Bureau,  
Washington, D. C.; Director, American Academy of Pediatrics Study of  
Child-Health Services, Washington, D. C.; and Surgeon, U. S. Public  
Health Service, Washington, D. C.*

IN November, 1944, when the American Academy of Pediatrics committed itself to undertake a nation-wide study of child health services, it is doubtful whether anyone realized the true significance or the magnitude of the step which had been taken. The recognition by an organized group of medical practitioners of their responsibility for informing themselves, through their own labors, about medical care matters, as well as their realization of the need for assistance from public agencies experienced in such undertakings, has produced a coöperative enterprise which is unique in many respects.

Simply stated, the objective of the study is to gather information on the present status of child health services in this country to be used as a basis for future planning. In accordance with this stated objective, the Academy, with the assistance of the U. S. Public Health Service, and the U. S. Children's Bureau, has developed a program

through which the facts concerning existing facilities and services for child health may be made available to all groups, public and private, national and local, for use in furthering programs for child health.

The most immediate as well as the most rewarding results of the study to date have been the development of a spirit of coöperative enterprise and the evident stimulation of interest among members of the medical profession. The almost universal demand on the part of the various states that the statistical material be returned to them as quickly as possible indicates both the great interest which the study has aroused and the apparent need for such a project at the present time. This increasing state and local interest has emphasized the importance of returning quickly to the states, information basic to local planning.

The difficulties anticipated in trying to secure adequate finances and personnel for the study have not proved as great as was feared. All but two states are conducting study programs, and these two are expected to get under way shortly. State programs have been financed from a variety of sources,

\* Condensed from a paper read by Katherine Bain, M.D., at Joint Session of the Maternal and Child Health Section and the School Health Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 13, 1946.



such as local chapters of the National Foundation for Infantile Paralysis, state departments of health, medical societies, tuberculosis organizations, local foundations, and other sources. Space, equipment, and clerical assistance, as well as funds, have been provided by many agencies, notably health departments.

Qualified personnel for the conduct of the study have not been as difficult to find as was anticipated. Of the 57 executive secretaries employed by all states, 33 are physicians of whom 29 are pediatricians. As of November 1, 1946, 5 states had completed their studies and had delivered their schedules to the central office for tabulation of the data; 11 states had completed the collection of the data, and 14 others were nearing completion. Surprisingly good returns on the schedules have been secured, with some states obtaining 100 per cent returns from pediatricians, and as high as 75 per cent returns for all physicians in private practice.

As the collection of the data nears completion, the question arises—What sort of information will be forthcoming from this study? Although a study of this type cannot answer the specific question—"How many children did not receive adequate medical care in a given year?" it can and will provide much valuable information concerning such items as the proportion of care rendered children by general practitioners as compared to the proportion given by specialists; the amount and type of pediatric training received by physicians who are caring for children; the proportion of visits to children for purposes of health supervision; the number of children admitted to hospitals annually; and the number of children who attend schools which have some sort of school health program.

Data on these and other items will be forthcoming shortly from the North Carolina study which has served as the

pilot study for the entire program. The North Carolina study, begun about a year ago, has been the pilot not only for methods of organization and the content and wording of the schedules but for the methods of analysis as well. Revisions of the original schedules have necessitated many revisits in North Carolina, but the data for that state are now coded, the cards punched, and the tables are being prepared. Soon after January 1, 1947, a complete report will be available from North Carolina which can serve as a guide for other state reports.

The following brief discussion of some of the material obtained in North Carolina will serve to indicate the type of information which will be available from this and other states in much more detail. The original list of physicians compiled for North Carolina contained 2,079 names. To each of these was sent a letter with the appropriate schedule (III-A) attached. Subsequent information concerning physicians who had died, moved, or were not in active practice, reduced this list to 1,571 physicians in active private practice. Of this number, 1,105 filled out a schedule completely or in part, a rate of coöperation of 70 per cent. In order to determine the difference in coöperation among the various age groups of physicians, a single item on the schedule, the completion of a one day record of child visits, was selected as the index of coöperation. A total of 966 physicians completed this part of the schedule (see Table 1). Coöperation was best in the younger groups, a little less than 75 per cent response having been received from the age groups under 45. For physicians over 65, the response was only 50 per cent. Perhaps younger physicians are more interested in problems of medical care, or perhaps the older physicians have become resistant, through long exposure, to the questionnaire method.

One question which the study pro-

TABLE 1

*Physicians in Private Practice Who Reported Number of Child Visits during One Day, by Age of Physicians. North Carolina, Spring, 1946*

	Total	Under 45	45-64	65 or Over
1. Total in North Carolina in private practice	1,571	536	817	218
2. Number who reported child visits	966	395	463	108
3. Per cent who reported child visits	61	74	57	50

poses to answer is, "Who takes care of the children?" Admittedly pediatricians are so few in number that if children are receiving care they must be getting it from general practitioners. What proportion then of visits made by general practitioners is for children? The average number of visits per day per general practitioner in North Carolina was 25. This figure includes patients seen in office, hospital, or patient's home. Of these 25 visits, one-third were for persons under 15 years of age (see Table 2). The pediatricians' figure for total visits per day was 26, very close to that of the general practitioner. Ninety-nine per cent of the pediatricians' visits were to children.

The figure of 25 visits per day per general practitioner was of considerable interest. The study was made in May

and June in North Carolina when low illness rates might be expected. Sundays, holidays, and days off were all included. The range of total visits for all physicians was quite wide. Eight per cent of the general practitioners made no visits on the report day, while 9 per cent made more than 50 visits. This sample of 558 general practitioners in North Carolina may be too small for reliable conclusions. The returns on this item from other states are awaited with interest.

If the general practitioner is giving so much of his time to child patients, is he seeing sick children or is he devoting a share of his time to health supervision of well infants and children comparable to the time given to this activity by the pediatricians (see Table 3)? Of home, hospital, and office visits to children made by pediatricians, 35 per cent, or

TABLE 2

*Number of Total Visits and Child Visits per Day per Physician: General Practitioners, Pediatricians, and Other Specialists. North Carolina, Spring, 1946*

	General Practitioners	Pediatricians	Other Specialists
1. Number of total visits per day per physician	24.7	25.5	20.1
2. Number of child visits per day per physician *	8.5	25.2	3.2
3. Per cent of total visits which were for children	34%	99%	16%
4. Number of physicians reporting	558	39	236

\* Children under 15 years of age

TABLE 3

*Number and Per cent of Child Visits in One Day Which Are for Health Supervision: General Practitioners and Pediatricians. North Carolina, Spring, 1946*

	General Practitioners	Pediatricians
1. Number of child visits per day per physician *	8.1	25.2
2. Number of child visits for health supervision per day per physician	1.6	8.7
3. Per cent of child visits which are for health supervision †	20%	35%
4. Number of physicians reporting	624	39

\* Children under 15 years of age

† Well children seen for health examinations, immunization, advice on feeding, and so forth

1 in 3 visits, were for well children. The comparable figure for the general practitioner was 20 per cent, or 1 visit in 5. The exact nature of this health supervision is not known. Many of the visits may have been for immunization alone. Further analysis may show that the general practitioner's practice is heavily weighted by visits to infants under 1 month, since obstetrics is largely in the hands of the general practitioner. Nevertheless, these preliminary figures indicate that the general practitioner plays a large role in health supervision.

What about the relative amount of child health supervision given by private practitioners and by medical well child conferences? To make such a comparison, certain adjustments in the figures must be made. Since the age groups served should be comparable, only child health supervision visits to children 1 month through 5 years by private practitioners have been included. Because the returns from well child conferences represent all the service in the state, the physicians' returns have been adjusted to 100 per cent (see Table 4). In North Carolina about .7 times as many visits for health supervision of infants and preschool children take place in the physicians' offices as occur in well child conferences. The general practitioner is doing about 4 times as much of this work as the pediatrician. Stated in another way: Of the visits for health supervision for the age group 1

month to 6 years, 71 per cent are made to general practitioners, 16 per cent to pediatricians, and 13 per cent to child health conferences. The actual load of the general practitioner is heavier still, for from a preliminary review of the Series II schedules, it is apparent that in North Carolina the general practitioner is an active participant in child health conferences.

One might go on from here to ask a number of other questions. How are the general practitioners trained in pediatrics? Within the last few years there has been great emphasis on growth and development and on behavior problems in the training of pediatricians. To what extent have these fields become a part of the training of the general practitioner? One section of the study is directed toward answering these and other questions on medical education. The study of pediatric education is just starting, a pilot study having been undertaken at the University of Michigan Medical School in October, 1946. During the current academic year all medical schools and teaching hospitals in the United States will be studied intensively regarding undergraduate training and specialty training in pediatrics.

Though results of the Academy study in the form of statistical tables are meager at present, other less specific results point to a substantially significant trend. Coöperation in a common

TABLE 4

*Total Volume of Health Supervision for Children Aged 1 Month to 6 Years, in One Day: Private Practitioners and Well Child Conferences. North Carolina, Spring, 1946*

Child visits for health supervision.....	Total	Number	Per cent
		1,330	100
By physicians		1,158	87
General practitioners		948	71
Pediatricians		210	16
To well child conferences (one day) *		172	13

\* Total visits 62,859 divided by 365

venture has been undertaken and has been successfully carried out between a private organization of physicians and two federal agencies. Interest of the physicians themselves has been captured. Many pediatricians who coöperated at first from a sense of duty, are now vitally interested and are making extensive plans for use of the material in their own states.

Although the immediate task has been limited to the collection and analysis of the facts concerning current child health services, it is apparent to all that this task constitutes only the first step toward the achievement of the ultimate

goal—the development of an adequate program of health and medical care for all children. To the members of the study staff who have been closely involved in the conduct of the study, the successful development of this spirit of coöperative enterprise and the evident stimulation of interest among members of our own profession have been the most significant and the most encouraging results of the study to date. All indications now point to a growing realization of the next step as a logical outcome of the present activities: the development of an action program to improve health services for children.

---

## National Hearing Week

The American Hearing Society announces National Hearing Week, November 9–15. In this campaign to focus public attention on the hearing, it is joined by its 120 local chapters throughout the states. Nearly 3,000,000

children and nearly one out of every ten persons in America have a hearing loss.

For details of the National Hearing Week, write the American Hearing Society, 1537–35th Street, N.W., Washington 7, D. C.

# The Value of Industrial Hygiene<sup>\*</sup>

T. LYLE HAZLETT, M.D., F.A.C.P., F.A.P.H.A.

*Medical Director, Westinghouse Electric Corporation, Pittsburgh, Pa.*

HYGIENE is a branch of medical science that relates to the preservation of health. This definition outlines the scope to which our thinking should be carried when we evaluate the effects that may result from the coördination of the many sciences that are contributing to the well-being of our industrial population.

Since the main objective is prevention of illness from the occupational environment, the medical profession must accept the responsibility and be the guiding spirit in realizing this objective.

The effects of any agent on the human body must of necessity be studied with regard to the normal physiological actions as well as the abnormal. This dual concept is fundamental in medical science. While the medical phase may play a dominant part in our evaluation of the worth of industrial hygiene there are three other distinct elements: engineering, chemistry, and physics, all of which must be closely correlated if we are to attain our objective.

Industrial management has at times overlooked the value of controlling industrial environment, not only from a purely economic basis but also from the point of view of the psychological reactions of the individual worker. This fact has been emphasized more recently by the increased interest shown in the matter by our organized labor groups which were keenly aware of the psychological factor in spurring the production reached during the period of World War II.

Perhaps the greatest advance made during the recent war years has been the attempt to analyze individual jobs in respect to the physical and mental requirements. This job analysis made it necessary not only to study the physical effort necessary for the job but also the chemistry of the materials involved in the job. Furthermore, the engineering aspects of the machine and its functional operation in its relation to the individual who has the responsibility of operation has elicited extensive study.

Much still remains to be done in this matter of relation of the worker to the job. It definitely is a phase of industrial hygiene in its broadest conception.

Since 1915 much has been accomplished by our efforts in accident prevention in our industrial plants. These efforts were based on the theory that all accidents can be attributed to mechanical failure. The human element, which perhaps is a factor of failure in 80 per cent of our industrial accidents, has been entirely neglected. In view of the broadening vision that industrial well-being is an asset in any accident prevention program to render it of real value, there must of necessity be an equal interest in and a study of the human element in its relation to the mechanical causes of all industrial injuries. This requires the close coördination of industrial hygiene personnel and those responsible for safe mechanical working conditions. With such an organization we will enter a new era in our efforts to reduce the enormous toll of accidents in industry. According to

<sup>\*</sup> Address of the Chairman, presented before the Industrial Hygiene Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 12, 1946.

statistics of the National Safety Council for the year 1945 there were 16,000 fatalities, 80,000 permanent disabilities, and 104,000 temporary disabilities charged to industry. This constituted a man-day loss to industrial production of 46,000,000 days—a loss which cannot be estimated in monetary value.

The working population in the United States now numbers approximately 60,000,000 persons, and out of this group there are probably 15,000,000 persons working in those industries which use potentially hazardous materials or processes. In these selected industries, perhaps about one-third of the total persons employed are exposed to some type of material or process which may involve a potential health hazard. These 5,000,000 exposed persons present a very real problem to industry throughout the nation, and the value of industrial hygiene is being demonstrated by the preservation of the health of these people.

During the war years a new viewpoint was developed toward industrial hygiene activities. Many industries suddenly were faced with the problem of protecting the health of thousands of men working with hazardous materials or processes. There was an instantaneous demand for trained personnel, and this demand was filled by drawing persons from related fields of activity in medicine, engineering, chemistry and physics.

One of the outstanding accomplishments in the field of control of occupational diseases during the war period was the work of McConnell, Flinn, and Brandt in government owned ordnance explosive plants. In the 968,000 man-years of operations (among 309,000 operating employees in 101 plants) there were only 28 fatalities because of occupational disease—22 from trinitrotoluene, 3 from nitrous oxide, 2 from carbon tetrachloride, and 1 from ethyl ether—a rate of less than 3 fatalities per 100,000 workers per year. Despite the

magnitude of explosives production, the total of 22 fatalities due to TNT reported here is but a small fraction of the 475 fatalities reported from TNT and related compounds during relatively limited production in World War I. The Army has a commendable record. It established this record even though there was no industrial medical program in the Army in 1941, by using civilian physicians already trained in this field. I am glad to see such results published.

Many industrial organizations have equally commendable records and they too should be published. In fact, I have been amazed at the dearth of such material in our journals. We can be proud of our records, so why not set them down for all to see? Our story in this regard which we all hope to see published soon and which again will show the need for and the value of industrial hygiene is that of the production of the atomic bomb. I am sure all of us, now that part of the story is known, can imagine the magnitude of the task which confronted the physicians, engineers, and physicists at plants engaged in this work. We do not know the whole story as yet, but at least we know industrial hygiene stood the test and was a great factor in the success of this project.

The atomic bomb was a dramatic unveiling of the tremendous power and energy which now can be made available for the benefit of man. It has opened new fields, not only for the possibilities in the generation of power, but it will make available many of the ninety-six known elements in radioactive form. The availability of these radioactive elements will result in many important applications. Perhaps one of the most important applications is their use as tracer elements. Another definite possibility is in their therapeutic application.

The smashing of atoms produces, among other things, tremendous radia-

tion; and the usefulness of the various radioactive elements will be determined to a considerable extent by the emanations which they give off. A challenge is presented to us in this preventive field, and the successful utilization of atomic energy will depend upon the elimination of health hazards associated with the variety of radiations which occur in their use. Electrons, neutrons, alpha particles, gamma rays and other radiations will be included in the field of industrial hygiene as lead and benzol have in the past.

Among examinations of noteworthy effort were those made on workers engaged in the manufacture of insecticide bombs for the armed services. Over half of the bombs produced used a formula containing pyrethrum, sesame oil and freon. Since none of these materials is very toxic to human beings, there was no particular problem of health protection involved. After DDT had been developed and sufficient information was available to indicate that it could be used with safety by personnel of the armed services, a potential hazard was created by continuous eight-hour-per-day exposure among persons performing the various manufacturing operations, and this had to be given serious consideration.

The problem involved not only the possibility of breathing the fine mist produced by the aerosol from the Bug Bombs, but also the possible significance of absorbing DDT through the skin. This hazard was recognized prior to the actual use of this material and, by close coöperation between our industrial hygiene engineers, manufacturing personnel, process and layout engineers, a complete new installation was made with protective measures built in as a part of the original layout of the equipment. Where it was not practical to eliminate the hazard by suitable design and layout of equipment, the hazard was controlled by use of personal pro-

TECTIVE equipment and sanitary measures. Adequate pre-placement and periodic physical examinations were made on all employees involved in this operation. Several months after production was started, certain laboratory findings indicated a need for slightly better control, and such control was established. The production of Bug Bombs has continued into the post-war period, and there have been no cases of illness of occupational disease as a result of these operations.

Another of the high production war items was radar equipment. The manufacture, testing, and operation of the various types of radar equipment involved numerous exposures to high frequency radiation. This type of radiation had been relatively unknown except in the laboratory, and of course there were many suppositions that this radiation might be harmful to human bodies. Some of the common illnesses to which average persons are subject were quickly associated in the workers' minds with this new radiation. Extensive tests and examinations have indicated, however, that these radiations have no harmful effect on persons other than the slight amount of heating which may occur. Usually this heating is negligible and no particular hazard has been demonstrated.

Recently a completely new concept has been established which unites the growing of food, its processing, packaging, and distribution. This close coordination of all these activities at one location has been referred to as "agro-industry." Agriculture and industry have been transmuted into a single integrative activity. This concept of agro-industry is extremely large. It is in fact one of those grand ideas that stagger the imagination with their scope, complexity, and implication. Agro-industry has been applied to the cultivation of cane and root crops, and the manufacture of starch and sugar in

the Everglades of Florida. This concept of agro-industry opens another new field in industrial hygiene.

The impetus given to the study and control of industrial health hazards during the past few years has resulted in a fuller appreciation of the value of industrial hygiene. It is a broadening field and it is now utilizing the services of hundreds of specially trained personnel. The field of industrial hygiene is continuing to draw talent from related professions and it is uniting physicians, chemists, engineers, and physicists in this broad endeavor of safeguarding the health of our industrial workers.

Those of us who are devoting full time to industry and attending the managers' meetings to insure an adequate budget for the current and following years have had it only too thoroughly impressed upon us that the era of "cost plus" is over; things are now different; competition in the price of production is again becoming the paramount issue, and curtailment of expense will be the keynote in every possible phase. This is quite a different story from the one we heard during the war period.

This brings us then to what I feel is an important phase of this discussion concerning the value of industrial hygiene. What are we as physicians doing to preserve the gains made during the war? What have we learned that is going to help us to continue to achieve greater stature among industrialists, the employees, and, last but not least, our own medical profession? It may be presumptuous to suggest the means by which an employer can evaluate his preventive hygiene service. Our experience in large and small plants, however, indicates that management is anxious to have a yardstick by which it can measure the effectiveness of all services. This applies in particular to those who are genuinely interested in the welfare of their workers.

There are tangible profits which may

be shown, such as a reduction in absenteeism, a diminution in the number of grievances presented by individual employees relative to working conditions, the reduction of occupational disease claims, the reduction of actual compensation costs through a reduction in accident frequency, and a reduction in labor turnover. The intangible benefits such as the improvement in general health as the result of periodic physical examinations, and an intensive program of health education can well be included in the estimate of the value of an industrial hygiene program in industry. All of this brings to our attention the necessity of an annual inventory of our work which can be presented to management only if adequate records are kept, and this factor too is of the utmost importance for future programs in the field of industrial health.

In considering the future value of industrial hygiene, one cannot neglect the problems of education. Although limited training now is available in various universities to those who wish to enter the field, there still is need for the establishment of complete courses which will develop workers for the field of industrial hygiene.

We all are familiar with the studies made a number of years ago which indicated that the mortality and morbidity rates among the industrial population were greater than those of the general population. The value of industrial hygiene will be measured in the future by a reduction of the mortality and morbidity rates of industrial workers to the point where they may even be lower than those of the general population.

It is not possible to treat this subject wholly in the time allotted or by a single presentation, but even a brief consideration of our topic suggests the existing challenge to us physicians, engineers, chemists, and physicists upon whom falls the responsibility of safe-



guarding the health of our industrial workers. And, further, it suggests a challenge which presents a new horizon and new frontiers in the field of pre-

ventive medicine in its broad aspects. If we meet this challenge we shall contribute greatly to the continuance of our American Way of Life.

---

## International Tropical Medicine Congress to Meet in Washington, May, 1948

Wilbur A. Sawyer, M.D., Executive Secretary of the State Department's Division of International Congresses, announces the first American meeting of the International Congress of Tropical Medicine and the International Congress on Malaria in Washington next May. The Department of State will sponsor the meeting with the coöperation of five governmental agencies and fifteen scientific societies including the American Public Health Association.

These organizations all have representatives on an Organizing Committee appointed by the Secretary of State with Thomas Parran, M.D., as Chairman, George K. Strode, M.D., and Clarke L. Willard as Vice Chairmen, Rolla E. Dyer, M.D., as Program Director, Wilbur A. Sawyer, M.D., as Executive Secretary, and William L. Breese as Secretary. The representative of the A.P.H.A. on the Organizing Committee is Henry E. Meleney, M.D., who is also Convener of Section XI, Public Health. The scientific meetings will be held in twelve sections: I, Research and Teaching Institutes; II, Tropical Cli-

matology and Physiology; III, Bacterial and Spirochetal Diseases; IV, Virus and Rickettsial Diseases; V, Malaria; VI, Helminthic Diseases; VII, Protozoan Diseases; VIII, Nutritional Diseases in the Tropics; IX, Tropical Dermatology and Mycology; X, Tropical Veterinary Medicine; XI, Public Health; XII, Medical and Veterinary Entomology. There will also be scientific and commercial exhibits and a program of motion pictures on subjects related to tropical medicine. In addition, there will be visits to the laboratories of the Department of Agriculture in Beltsville, to the National Institute of Health in Bethesda, and to other scientific institutions in and around Washington.

Physicians, scientists, and other professional persons qualified in tropical medicine will be enrolled as Members of the Congresses. Those interested are advised to write to the Executive Secretary, Fourth International Congresses on Tropical Medicine and Malaria, Department of State, Washington 25, D. C., for a copy of the Preliminary Announcement with the Advance Registration and Hotel Reservation Form.

# Age and Sex Variations in Hospital Utilization\*

(An Example of Morbidity Data Available from Blue Cross Records)

J. D. COLMAN, M.E.

*Executive Director, Maryland Hospital Service, Inc., Baltimore, Md.*

WHETHER a patient did or did not receive hospital care is likely to be governed by his geographic location rather than by the type of condition needing care. However, the practical fact that much data describing serious illness are available from hospital records forces us, at the outset, to accept a compromise with our instincts of precision. Hence we find much morbidity data based on the frequently unbiologic and unpathologic distinction between illness cared for in or out of hospitals. Even in view of the wealth of material available concerning the utilization of hospital care, its usefulness has been materially limited by the difficulty in arriving at any satisfactory description of the population from which these hospital patients came. Thus significant incidence rates expressed in terms of hospital patients per unit of population per year were available only in their crudest form.

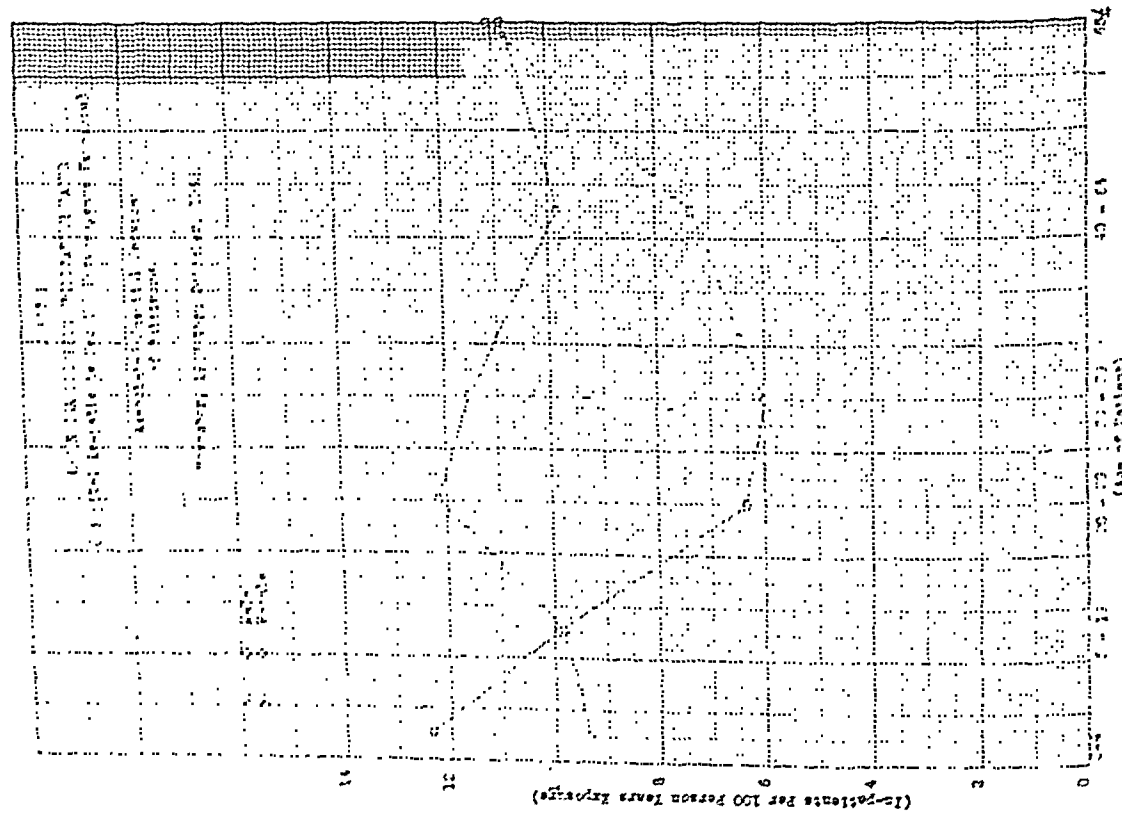
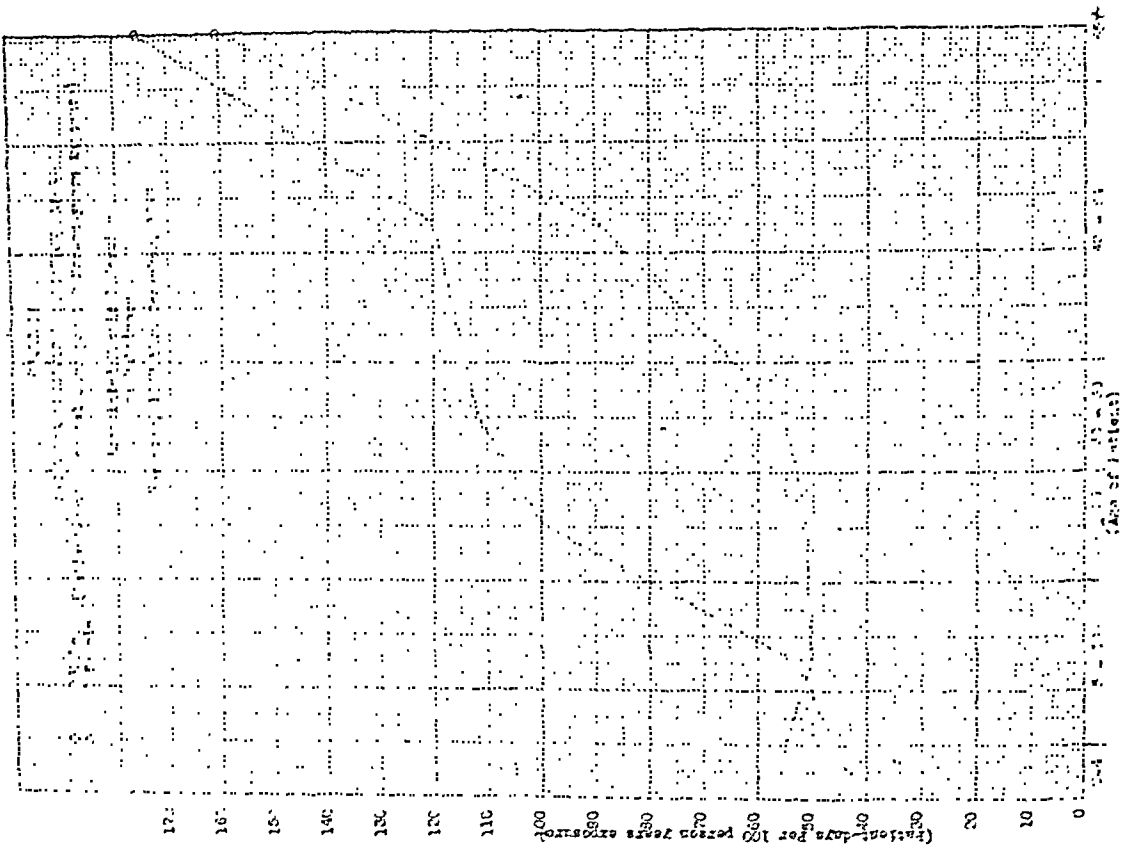
The growth of Blue Cross Plans is of interest in this connection because they have the unique advantage of having a known population base. It is possible to, and they do count carefully, the people who comprise their population because it is necessary to collect subscription charges from them. Consequently, we have, for the first time, a large portion of the population whose

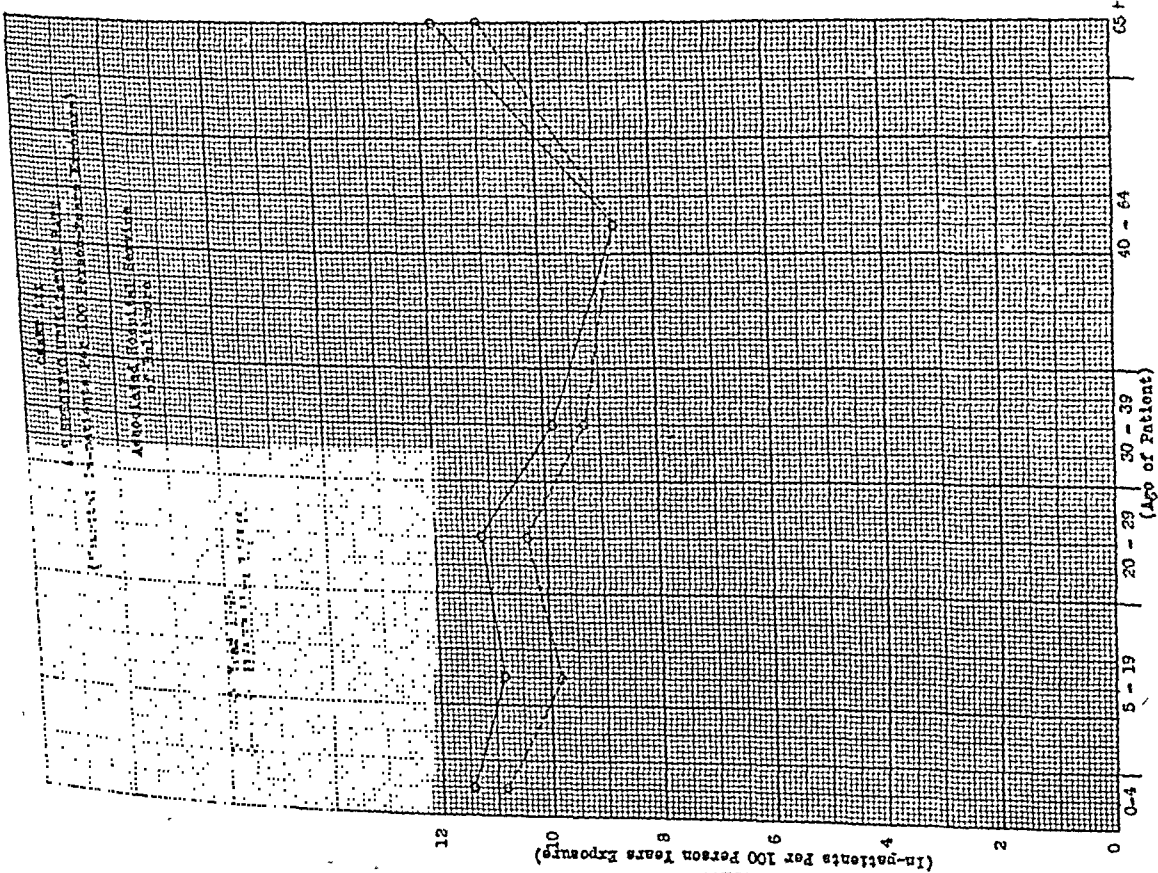
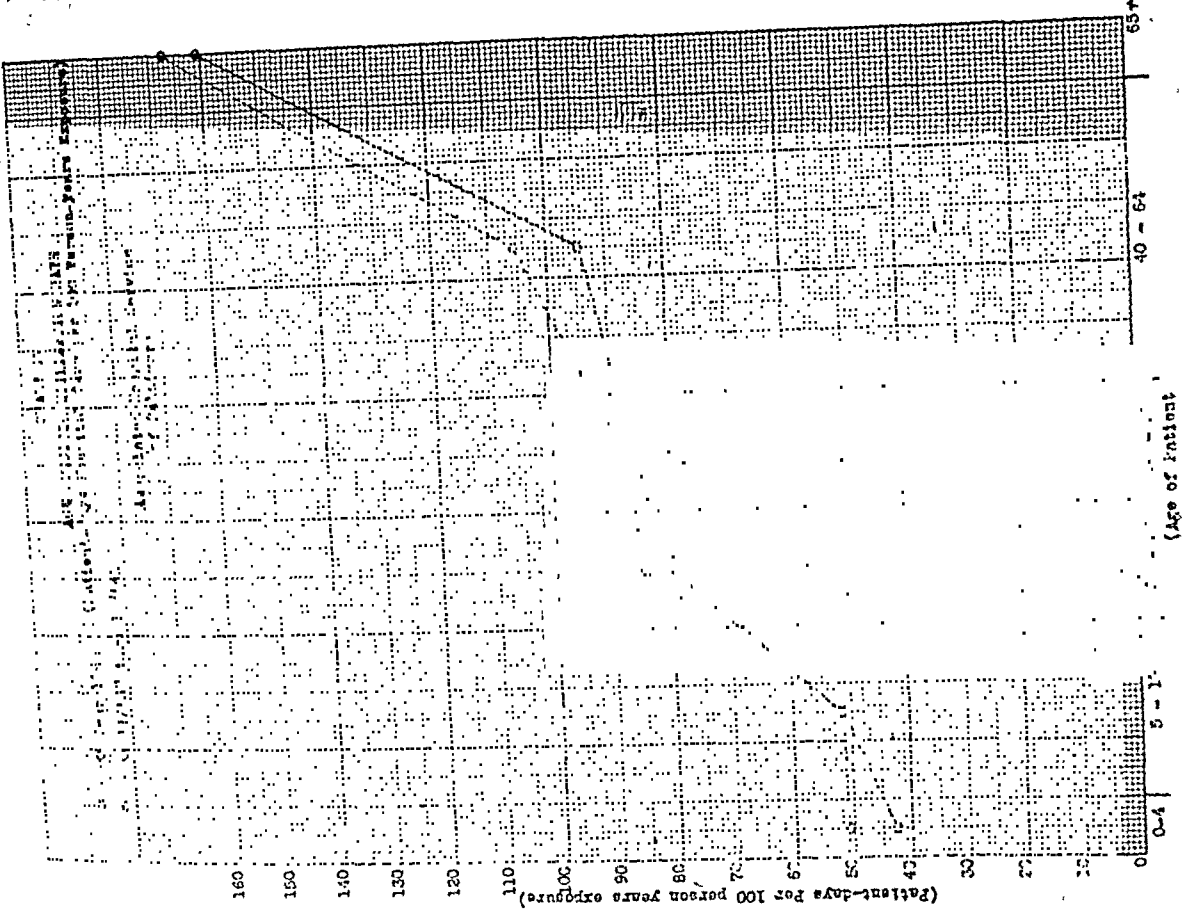
use of hospital care is known and whose characteristics as to age, sex, marital status, residence, etc., is known for both that portion of the population that was hospitalized and that portion that was not.

As the proportion of the population enrolled in Blue Cross Plans grows, the likelihood of their enrolled population being materially different from the total population diminishes. The most challenging of the opportunities for study of hospital morbidity offered by Blue Cross data is that which recognizes that, for at least some of our subscribers, the hospital history is continuous over a long period of time. Fifty-six per cent of the participants enrolled in the Baltimore Blue Cross Plan in 1937 are still active subscribers. Very little data of this sort have been developed and it would appear that some important facts would be disclosed from their study. The considerations introduced by the diminishing population base are serious, but do not nullify the value of the study.

As an example of the kind of information which is available from even a simple analysis of Blue Cross records, I present a study of the experience sustained by the Maryland Hospital Service in which its utilization data are classified by the age and sex of the subscribing population. In considering these data, I should remind you that for the most part the experience described was sustained during the war

\* Presented before the Vital Statistics Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 13, 1946.





years and that only a portion of the obstetrical care used by the population is included herein. Otherwise, however, these data represent a reasonably complete description of the hospital care received by this population in acute general hospitals.

Chart I describes the incidence rate in terms of hospital patients per 100 person-years of exposure—classified by age and sex. From several points of view this is interesting, but much more significant, particularly from the economic standpoint is the data shown in Chart II.

This chart describes the utilization of hospital care in terms of patient days of hospital stay per 100 person-years of exposure—classified by age and sex. The intense variation with age should be of great significance to hospital administrators in planning for the amount of hospital facilities needed in the future in view of the changing age distribution of our population.

It will be noted from the headings on the two previous charts that these described the experience during the entire life of Maryland Hospital Service from November, 1937, to December, 1945. Because of the rapid growth of the subscribing population, most of the exposure supporting these data was sustained during the last three years of this time interval. As one might expect, there have been slight changes during the period which might well be the subject of more exhaustive study.

An indication of these changes is given on Chart III in which age-specific utilization rates, expressed in terms of hospital patients per 100 person-years exposure are shown for the calendar year, 1945, as well as for the entire period, November, 1937, through December, 1945. It is obvious that the frequency of admission has tended to increase at all ages except the 40 through 64 group.

By reference to Chart IV, however,

the effect of crowded hospital facilities is seen. Chart IV presents hospital utilization in terms of patient days per 100 person-years exposure, classified similarly as in Chart III. From this it will be seen that even though the frequency of hospital admissions had increased, the volume of hospital care rendered per unit of population is less during 1945 than for the entire period.

While I have not burdened you with the detailed data supporting these charts, I may say that sufficient exposure supports each point on Charts I and III so that they may be considered statistically significant. I have not yet been able to find my way through the mathematical maze of significance as it applies to a rate expressed in terms of patient days per 100 person-years of exposure. Therefore, I express no opinion on the statistical significance of Charts II and IV, except the "horseback" one that if the rate for patients is significant, the rate based on the days stayed by the same patients from the same population is likely to be.

While some interesting trends are revealed in these data, my purpose in presenting them here is not so much for their intrinsic value but rather to stimulate any of you who have access to Blue Cross records to explore their potentialities more fully as a source of significant morbidity data. The obvious objections of possible selection can, in many cases, be overcome if careful extraction of specific rates is made from which useful adjusted rates can be computed.

Many plans are now using the diagnostic code developed by the U. S. Public Health Service and the Bureau of the Census. The happy fact that a practical Diagnostic Code and a known population came into being at the same time should materially extend our understanding of acute illness. The epidemiology of the acute appendix and the hypertrophied tonsil, if you will!

# The People Win for Public Health in Colorado\*

FLORENCE R. SABIN, M.D.

*Chairman, Subcommittee on Health, Colorado Post-War Planning Committee, Denver, Colo.*

TWO years ago the State Government in Colorado had only one interest in its Division of Public Health; namely, that it was one more place in which to try to force political appointments. Moreover, the Denver city machine had had a remarkably successful record in defeating health bills in the legislature. The machine had only to pass the word down the line to kill health bills, and they were killed.

Now, what a change! There is a new Governor, Lee Knous, who campaigned for good government and specifically for a health program, and is enthusiastically carrying out his pledges. On May 20, 1947, an election in Denver brought into office a new Mayor-elect, Quigg Newton, a young man who ran, without benefit of party, against government by political machines. He won more votes than all four other candidates together. He understands the fundamental principles of the movement; he wants, just as eagerly as informed citizens, a modern, professionally staffed health department, and a strengthened medical school for training physicians for both curative and preventive medicine—indeed a true medical center for the Rocky Mountain region. No wonder Coloradoans walk on air and talk of health to match their mountains! They have won the decisive battles of their campaign and now have only to get on with the business of pub-

lic health in Colorado. As a matter of fact, recent history has even more significance than any one cause, however vital, for it has shown that under our American form of government whenever our people really want good government they can have it.

The story of the health program is as follows: In 1945 the Governor of Colorado appointed a Health Committee as part of a post-war planning program and was then persuaded by this committee, by the State Division of Public Health, and the Colorado Public Health Association, to ask for a health survey of the state. By great good fortune, the American Public Health Association was able to undertake a survey through a grant from the Commonwealth Fund, and its Field Director, Dr. Carl E. Buck, came to study conditions.

Dr. Buck made a masterly report. He studied the vital statistics of the State Health Division, analyzed and arranged the data until they told a vivid story of the state's health deficiencies. He found that the State Health Division was badly placed in the government, being a division under the Governor instead of a department, and that it had been subject to repeated attempts at political control. He found that the division had an able director and a small but well chosen professional staff; however, state appropriations were pitifully small—less than 10 cents per person per year—so that the division would have had almost nothing had it not been

\* Presented at the Fourteenth Annual Meeting of the Western Branch, American Public Health Association, San Francisco, May 28, 1947.

for generous federal grants; that the City of Denver, by a curious archaic charter, was a so-called "Home Rule City" beyond the reach of modernizing influences from the state; and that of the 63 counties only 4 had full-time health services. Dr. Buck's report revealed the short-comings, pointed out the reasons for them, and made what proved to be expert recommendations for their correction.

Two different types of work were then started, both closely correlated with each other; first, the organization of an executive committee for intensive study of the report and for drawing up the bills to be presented to the legislature; and second, the carrying of Dr. Buck's report and of all the Health Committee's plans as they developed directly to the people of the state.

An executive committee, authorized by the large general committee, had many long conferences. Most of them were at dinner meetings. At each meeting were invited guests who were either representatives of groups that would be affected by the proposed development of health services, or experts who could help with special knowledge and advice. Thus opposition was forestalled in advance. Civil Service Commissioners were also invited to discuss common interests.

One of the outstanding achievements of the program was the full coöperation between the State Medical Society, reaching all the doctors in the state, and the various public health agencies. Two members of the Public Policy Committee of the State Medical Society became members of the Health Committee and made a liaison between the two groups. Common bills were presented to the legislature, jointly drawn and jointly sponsored. Indeed the Medical Society gave up its tax-exempt status and increased its dues that it might support an active lobby.

Another important success in the

health program is that support of the dairy industry was won for health inspection. Like the dairy group in some other states, the group in this state had long feared and fought health inspection of its industry. Many conferences were held with them which were indeed initiated at a luncheon to which they invited the Health Chairman. She was bumptious enough to ask them why they fought the program, and invited them to have a representative on the Health Committee. He gave much help and arranged conferences with members of the Dairy Association, and with all the experts on the subject of milk in Colorado, both from the federal and state groups. Full agreement was reached on the need for higher standards and improved practices for production and for processing of milk and milk products, but the dairy industry wanted to have it designated by law that a dairyman must be on the Board of Health to represent the industry. The Health Committee refused to accept the principle of representation of any group by law. The point was won in the legislature, much to the committee's surprise. The committee was not opposed to the choice of a dairyman for the Board of Health—indeed the Governor appointed both a producer and a processor. Now the State Department of Health and the dairy industry will work together with good will to a common purpose. This is an interesting example of a method of dealing with a controversial issue of long standing; namely, extended discussions to separate the many details on which adjustments can be made from the very few principles, or perhaps only one, too critical for compromise.

When the committee had completed the study of the report and its recommendations, it started to formulate the proposed bills. Fortunately able and experienced legislators and attorneys were members of the committee. It also had the invaluable aid of an attorney,

Hubert Henry, Chairman on Health of the Interim Committee of the Legislature, together with the help of the able secretary of the Legislative Reference Bureau, Clair Sippel. The bills were drawn in advance so that preliminary copies could be sent to the county chairmen and so that they could be introduced early in the session.

The winning of popular support for the program was crucial to its success. Since this was a state program, popular education was started in the counties. Dr. Buck helped to organize the first inter-county meeting. Indeed, every county meeting drew its audience from at least two or more counties. This was always highlighted by definite identification of each county group. It will be remembered that distances are great in Colorado; people drove 75 to 100 miles to meetings. They had been shocked by the complete defeat of the health bills in the last session of the legislature and so were ready to listen. At the early meetings, Dr. Buck with the help of a blackboard, let the facts about the appalling death rates from preventable and controllable disease sink in as the audience listened to the speakers. He showed how essential participation by the audience was to a program.

The committee had no state appropriation for its work but the Division of Health received the approval of Dr. Fred T. Foard, Regional Director of the U. S. Public Health Service, to use federal funds. This, together with a grant from the Colorado State Tuberculosis Association, enabled the committee to have an executive secretary. Herbert Moe organized the meetings and was always able to attract an audience eager to hear the story of Colorado's public health. One member of the committee had wide acquaintance all over the state and was able to find local citizens who could lead their communities. Persons were chosen as individuals rather than as representatives of organizations. At

first each name had to be submitted to the Governor, but he was finally persuaded to give the committee a free hand. Teams recruited from the State Division of Public Health, the medical school, the public health physicians of the public schools, and other groups were provided for each meeting. Dr. Roy L. Cleere, Director of the State Division, took to each county data concerning the local problems, and showed how close should be the coöperation between state and county health services. There were no prepared speeches but new data as developed in the executive committee, were taken to each meeting. A second meeting in a given place always brought the comment, "How your program is growing."

The committee did not itself organize action in any group but merely presented data on conditions, local and state, and showed what public health services could accomplish. Initiation for action was left to the people themselves. As a method, it is the exact opposite to the building of a political machine; it leaves one less sure of results, but with a more lasting foundation. Each local group took up some problem of its own. The first response was in a town where the raw sewage was going into the river and the Mayor soon started a fund for a disposal plant.

In one town the women said that they could see so much dirt in the milk that they did not use it at all. Within a few days the very efficient Supervisor of Nurses and the City Manager of the town with ten women met with the committee in Colorado Springs. El Paso County has an exceptionally efficient milk inspector, really a public health educator—and had developed there a milk supply that is both clean and safe. The group saw a perfectly run dairy—run by a woman, I am pleased to say—and a pasteurizing plant that is the last word in excellence. As a result, the town in question now has good pasteurized



milk shipped in by two companies and a local dairy is putting in a pasteurizing plant. The dairy industry might take notice that public health services are good unpaid advertising agencies, when milk is made both clean and safe. None of the groups did just the same type of work, but all supported the state program and all enjoyed the prestige of working as a Governor's Committee. One group worked politically and reported that all candidates who were against the health movement were defeated and all who were for it elected.

Another phase of the work that has aroused great enthusiasm and rivalry in the state is the federal hospital program. Dr. Foard assigned two members of his staff, Dr. Le Grand Byington and Dr. H. T. Wagner, to make a survey of the hospitals; a medical social worker from the State Division of Public Health, Helen Cannon, visited every hospital to aid in making out the schedules for the Commission on Hospital Care.

As evidence of the interest of the people of Colorado in the health movement, it is now many months since the committee has itself organized a meeting. Rather, every meeting has been on invitation, and speakers have gone to clubs and other groups all over the state. Committee members have spoken, it would seem, to almost every club in the state, both men's clubs and women's clubs. Many of the women's clubs have made the health program their special work for the year; for example, the American Association of University Women and the Parent-Teachers Association in every town where they are organized. In addition, the Women's City Clubs, political clubs, the League of Women Voters, and the Federation of Women's Clubs have all given skilled help. The Chambers of Commerce of the cities have heard about the health program, as well as many Kiwanis and Rotary groups. The Junior Chamber of

Commerce and the Isaac Walton League have actively worked for the program. Groups of lawyers, ministers, college, university, and church groups have been addressed. During the weeks before election the author spoke about twice a day, occasionally three times.

Nor has Denver been neglected, nor have the people of Denver failed to hear of the deficiencies of their so-called Health Department. Both newspapers in Denver, as well as the county papers, and the radio gave unstinted support to the new era in health. After election it was planned to let every legislator hear of the health bills in his home town. The result was summed up in one sentence by one of the prominent legislators who said, "We all knew in advance that this time we had to pass the health bills." The people of Colorado had willed it so.

What bills were introduced? Eight bills in all were presented, each one introduced to the legislature under sponsorship of the committee. There were two groups of bills, five bills setting up services for health and appropriations for them, and three bills for controlling special diseases. The first two bills concerned public health services.

The State Reorganization Bill created a new Department of Public Health, with a Board of Health and an Executive Division. The Board of Health was to be of nine members appointed by the Governor in such manner that no business or professional group would constitute a majority. This concession was made by the doctors. The bill gave to the new department powers adequate to meet its responsibilities in improving the health of the state. Some opposition to this bill developed in the Senate, but only from a certain group of the healing arts, who did not so much oppose the bill, but sought to place riders on it to gain advantages or escape restrictions for their cult. Hard work defeated these proposed amendments. The second

health bill was permissive legislation for facilitating setting up county, city-county and multiple-county health units. Both of these bills passed early in the session. They were well drawn and are worthy of study.

The third bill for appropriations and, as is customary, was presented late in the session with appropriations for all divisions of government. The requests were in two parts—one for the State Department and the other for aiding county units. These bills were given intensive study by the appropriations committee and, though no group obtained all it asked for, the Health Department received funds adequate for great improvement of its services. The grant for state aid to the counties was raised from nothing to \$150,000 for the biennium.

The fourth bill was an enabling act to meet the federal requirements for participating in the new hospital construction program. The fifth bill was an appropriation bill for the medical school. Under the new Dean, Dr. Ward Darley, plans have been developed to stress public health and the training of more general practitioners, rather than specialists. Dr. Darley also plans to have a two or three year residency with the last six months to be taken in the new county hospitals. These plans are an important advance in medical education and the committee was glad to endorse this program.

The three special bills were as follows: two were to lessen incidence of tuberculosis, the third was to decrease Bang's disease in dairy cattle. The bills in regard to tuberculosis were drawn by the State and Denver Tuberculosis Associations and endorsed by the Health Committee. An increase in the per diem allotment to hospitals of from \$4 to \$6 for the care of indigent cases was obtained. It was hoped to obtain money for the construction of a new ward of 100 beds at the Colorado Gen-

eral Hospital under the direction of the Medical School, but support was won for a 30 bed ward only. This will, however, aid in the development of chest surgery in the state, place a number of tuberculosis patients in a general hospital, and help with the training of medical students in this disease. It is a minor gain, to be sure, and indicates hard work ahead during the next session of the legislature.

The so-called Cow Health Bill was the only complete defeat of the committee. It was drawn by a veterinarian on the committee to check the sale of dairy cows that are reactors to Bang's disease. It did not include compulsory testing nor require slaughter, but simply the quarantining and reporting of infected cows. The bill was killed by the livestock interests by having it referred to the Livestock Committee where it was permanently buried. Colorado's important beef and dairy cattle industries make the eradication of Bang's disease unusually difficult. The inter- as well as intra-state shipment and sale of infected animals complicates control measures. This disease is a national problem. Obviously much study must be given to the type of legislation needed, and much research is necessary. How do you account for the fact that a cow may react negatively to the agglutination test and at the same time show a positive blood culture? How effective is calf vaccination? These are some of the questions needing investigation.

The legislature adjourned in April. Already the new State Department of Public Health has been reorganized and strengthened in accordance with modern practices. The department has been asked to help four groups of counties to plan new district health units. This is entirely on the initiative of the counties themselves. These are the first fruits of the program giving the people themselves scope for exercising their own initiative.

One of the meetings was especially interesting. The new law provides that the units are to be set up by vote of the county commissioners. The commissioners of five counties were present. All of those who came from counties where there had been any public health nursing were enthusiastically for the unit. A commissioner from the county that had never had any service said that temperamentally he had to express some opposition against such unanimity of opinion and for his part he was fearfully worried lest swarms of public health workers descend on his county and ask

for jobs. He never knew how funny he was, since the real worry was to find even one public health worker for his county. Personnel is now the major problem in this state as it is everywhere.

All during the war years the now Ex-Governor refused to authorize the use of federal grants allotted to the Division of Health to aid in training public health workers. Thus we have no backlog of personnel; we are developing a training program, but the need is to set up new services now. The people of Colorado are enthusiastically for adequate public health services.

---

## Fourth Interim Health Commission Meets in Geneva

Global health conditions were reviewed by approximately 100 international medical and public health leaders at the Fourth Session of the Interim Commission of the World Health Organization at Geneva Switzerland, August 30 to September 13. These included delegates of the 18 nations on the Interim Commission.

Among the subjects discussed by this session was the World Health Assembly which must be convened within six months after the 26th

United Nations country ratifies the WHO Constitution. To date, 13 UN members have approved the document: China, United Kingdom, Canada, Iran, New Zealand, Syria, Liberia, Ethiopia, Netherlands, Saudi Arabia, Turkey, Union of South Africa, and Norway. In addition, 6 non-members have ratified.

The United States delegate at this session was Thomas Parran, M.D., Surgeon General of the U. S. Public Health Service.

# Standards of Dental Care in Public Health Programs for Children\*

NORMAN F. GERRIE, D.D.S., M.P.H.

*Senior Dental Surgeon, U. S. Public Health Service, Washington, D. C.*

AT the present time, the majority of state health programs provide for some type of public health dental activity.<sup>1</sup> Study of these dental programs reveals considerable variation in type and in the features which receive greatest emphasis. The program content has developed as the result of local conditions, expediency, tradition, available funds, and decision by influential persons or groups as to the most effective way of spending funds. Consequently, all states do not conform rigidly to a single type of program. Although it is generally agreed by dental administrators that the objectives of the public health dental program may be accomplished by education, prevention, and treatment, there has been much discussion relative to the potential scope or definition of each of these three basic features of the dental program. Until recently, there was no means whereby prevention of dental disease might be exercised; it is found, therefore, that dental health education and dental treatment service, either alone or together, tend regularly to comprise the principal activities currently conducted as legitimate activities of the dental programs in many states.<sup>1</sup>

Dental health education is a prominent feature of dental programs. In some cases it is the exclusive feature. In practice, dental health education of the public by state agencies may extend

from the presentation of simple facts on dental health for the guidance of the individual to an attempt at exposition of the whole field of dentistry as it is known and understood by the dentist.

The term "prevention" has been interpreted frequently as treatment for prevention, particularly in the control of dental caries. Based on this interpretation, provision of treatment was justified as a preventive measure on the grounds that filling of carious teeth would control caries to the extent of preventing undesirable sequelae which would culminate in loss of teeth. Recent developments in the use of fluorine as a true preventive of caries promise methods which will reduce considerably the prevalence of this disease.<sup>2, 3</sup> Many state dental administrators have indicated a desire to incorporate in their activities, technics for using fluorine as soon as the efficacy of these methods has been conclusively demonstrated.

Although no longer considered a true preventive measure, in the sense that its use will prevent a disease from occurring, at the present time treatment is considered to be an essential part of the dental program. The use of fluorine as a preventive agent is expected to reduce the prevalence of caries by perhaps 40 to 50 per cent. However, there is still a large amount of caries which will occur, necessitating dental treatment by operative procedures for its control. In addition, there are other dental disorders which create a substantial need for dental treatment of various kinds.

\* Presented before the Dental Health Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 13, 1946.

The wide variation in thought and practice relative to the scope of treatment services in public health dental programs makes it desirable to offer in this presentation an interpretation of the potential range of treatment which might be provided. It is likely that one or more, or perhaps all, of the items to be suggested have been provided at one time or another in various public dental treatment programs. Certainly, in the field of private dental practice they are all considered essential to the health of the individual. The decision that a given item of service is necessary, advisable, or desirable if dental health is to be secured for the individual is directly related to the acceptance of a definition of dental health. The means employed to secure the objectives established by this definition are basic dental health requirements, whether treatment is rendered to the patient in the private dental office or in the public dental clinic. Since the items of treatment presented here have been evaluated for inclusion on the basis of a specific definition of dental health, this definition is offered for consideration.

There are many factors which influence the design of such a definition. It is unlikely that any definition would hold for long because of changes in the science of health and changes in the relative importance of its objectives. It is undesirable that any definition should

be so inflexible that it cannot be adjusted to such changes. On the basis of these considerations, therefore, dental health may be defined as "the objective which the dental profession has in mind in assisting the individual to achieve a satisfactory state of function, comfort, and appearance, provided that his condition has been completely appraised, that he has been informed of existing defects, and that proper treatment has been suggested and made available to him."\*

Based on this definition of dental health, and with due allowance for the practical limitations which would necessarily affect any application of the treatments suggested, the following services might then comprise the dental treatment program. They constitute the means by which the objectives of dental health may be secured. It will be noted that the items presented are given as optimal services and also as minimal services. It is expected that the services provided would range upward from minimal to maximal, in accordance with circumstances which might impose limitations on the individual program. In practice, the scope of the dental treatment program would fall at some point between the extremes suggested.

\* A modification of a definition of health by Lawrence J. Henderson, Professor of Biochemistry at Harvard University. Prepared by graduate students in public health dentistry, University of Michigan, April, 1946.

## DEFINITION OF DENTAL HEALTH TREATMENT SERVICES FOR CHILDREN \*

### *A Statement of Policy:*

Considering the present available information on the scope of services required to assure the health of young patients, an oral health program should provide treatment, preventive measures, and health education.

It appears that limitations of treatment services, due to insufficient funds or personnel,

are best applied on the basis of the number of children or age groups to receive care rather than on the number of services or types of treatment to be made available. It seems reasonable, therefore, to provide adequate care for a selected group of children rather than limited services for a large group of children. If dental health programs are developed for the youngest age groups and continuity of care provided thereafter, an accumulation of defects is impossible, and an optimum condition of health, comfort, appearance, and func-

\* Based on a statement prepared by graduate students in public health dentistry, University of Michigan, April 1946.

tion would be maintained throughout the period of childhood.

#### *Optimal Dental Services:*

##### *1 Period from Birth Through 2 Years \*†*

- a. Surgical treatment by a competent oral surgeon for the cleft lip or palate.
- b. Treatment of mouth infections.
- c. Application of preventive measures for securing and maintaining oral health.
- d. Recommendation or institution of procedures for breaking harmful habits.

##### *2. Period of the Primary Dentition (3-5 years) ‡*

- a. Orientation of child to dental environment.
- b. Procedures preliminary to diagnosis:
  - (1) Examination
  - (2) Essential dental records
  - (3) Radiograms as required to detect caries and dental anomalies, and to study development, root-end conditions, and progress of treatment.
- c. Post-operative observation and supervision of the cleft palate patient.
- d. Prophylaxis.
- e. Application of preventive measures for securing and maintaining oral health.
- f. Restoration of carious teeth:
  - (1) Silver amalgam for posterior and anterior teeth.
  - (2) Disking of anterior teeth when incisal angle is involved.
  - (3) Use of cast restorations for broken down molars on the basis of individual diagnosis.
  - (4) Local anesthesia to be used on the basis of individual diagnosis.
  - (5) Cement bases to be used on the basis of individual diagnosis.
- g. Pulp treatment: The pulpotomy technic will be used to manage vital exposed pulps in this period of dentition.
- h. Treatment of mouth infections.
- i. Extractions (type of anesthesia to be determined on the basis of individual diagnosis).
- j. Orthodontic treatment as required.

##### *3 Period of Mixed Dentition (6-12 Years) §*

- a. Examination, diagnosis, prophylaxis, post-operative supervision of the cleft palate patient, and application of preventive measures to be the same as for the period of the primary dentition.\*
- b. Restoration of carious, hypoplastic, and fractured teeth:
  - (1) Silver amalgam routinely for posterior teeth and primary anterior teeth.
  - (2) Silicate cement routinely for proximal surfaces of permanent anterior teeth.†

- (3) Treatment of fractured permanent anterior teeth.

- (a) Parapical radiograms.
- (b) Pulp test.
- (c) Temporary sedative treatment.
- (d) A substantial restoration such as the  $\frac{3}{4}$  crown casting, with window for esthetics.

- (4) The use of cast restorations for hypoplastic or badly broken down permanent teeth that cannot be restored satisfactorily by plastic filling materials.
- (5) The use of cast restorations for broken down primary molars on the basis of individual diagnosis.
- (6) Local anesthesia and cement bases to be used on the basis of individual diagnosis.

#### *c. Pulp treatments:*

- (1) Complete treatment for all conditions arising in the permanent anterior teeth, including root resection.
  - (2) Pulpotomy for vital exposed pulps of posterior permanent teeth.
- d. Lost permanent anterior teeth to be replaced by an acrylic palatal plate until a fixed bridge can be placed.
  - e. Lost permanent posterior teeth: The lost tooth or teeth may be replaced by an acrylic restoration, clasps being attached to adjoining teeth.
  - f. Treatment of mouth infections.
  - g. Extractions (Type of anesthesia to be determined on the basis of individual diagnosis).
  - h. Treatment of any condition requiring oral surgery.
  - i. Orthodontic treatment as required.

##### *4. Period of Permanent Dentition (13-17 years) ‡*

- a. Examination, diagnosis, post-operative supervision of the cleft palate patient, prophylaxis, and the application of preventive measures to be the same as for the periods of the primary and mixed dentitions.\*
- b. Restorations, anesthesia, and bases for carious and injured teeth to be the same as for the period of the mixed dentition.
- c. Lost permanent anterior teeth: Same treatment as for the period of the mixed dentition.

\* Orientation of child to dental procedures is to be included if required.

† The use of metallic fillings should be considered for the restoration of the lingual pits of incisors and the distal surfaces of cuspids.

‡ When a thorough diagnosis indicates the need for additional operative procedures, they may be utilized.

d. Lost permanent posterior teeth: Same treatment as for the period of the mixed dentition.

e. Pulp treatments:

- (1) Anterior teeth: Same as for the period of the mixed dentition.
- (2) Posterior teeth: Pulpotomy until approximately the 14th year, the exact age to be determined by the operator through radiograms and other diagnostic aids on an individual basis. Root canal fillings should be inserted routinely wherever and whenever indicated, on individual diagnosis.

f. Treatment of mouth infections.

g. Extractions and surgery: Same as for the mixed dentition period. (Now may include 3rd molars.)

h. Orthodontic treatment as required.

#### *Minimal Dental Services:*

It has been suggested that any program of dental care which cannot meet optimal standards should include as a *minimum* the following services:

- (1) Examination and diagnosis.
- (2) Prophylaxis.
- (3) Application of preventive measures.
- (4) Restoration of carious or injured teeth
- (5) Pulp treatment.
- (6) Treatment of gingivitis and mouth infections.
- (7) Extractions.
- (8) Treatment of developmental anomalies of the mouth.

#### *Order of Services:*

It has been suggested further that within the group to be provided service, dental care should be rendered in the following order of decreasing emergency, assuming that sufficient examination, diagnosis, and treatment planning has been provided:

- (1) Treatment of all acute or painful conditions of the teeth and severe infections or injuries of the soft and supporting tissues of the mouth.
- (2) Treatment or removal, or both, of infected primary and permanent teeth which have passed the acute or painful stage, and provision of partial pulpectomies for young teeth with vital exposed pulps.
- (3) Treatment of gingivitis or mouth infections which have passed the acute or painful stage.
- (4) Repair of injured permanent teeth and

those permanent teeth attacked by caries.

- (5) Restoration of primary teeth attacked by caries.
- (6) Root surgery for those infected permanent teeth which are of strategic importance to the denture, and in which infection can be eliminated and the root canals hermetically sealed.
- (7) Simple prophylaxis.
- (8) Orthodontic and prosthodontic care for those dentures in which the occlusion interferes with masticatory function seriously, or with the health of the supporting structures, or with the emotional stability of the child.
- (9) Orthodontic supervision for those dentures in which the occlusion presents a serious potential threat to masticatory function, health of the supporting tissues, or emotional stability of the child.
- (10) Provision of treatment for oral anomalies such as cleft lip and palate or mid-line supernumeraries, according to a treatment priority determined by the relative emergency of the condition.

#### SUMMARY

The evolution of the public health dental program has resulted in general agreement, based on current understanding of objectives and methods, that education, prevention, and treatment shall constitute acceptable phases of the program.

The scope of each of these phases is established in accordance with individual interpretation, policy, and practical limitations.

The definition or potential scope of any phase is directly related to a definition of dental health. A definition of dental health is offered for consideration.

In terms of this definition the items of dental treatment considered essential to accomplish the objectives of dental health are outlined.

Since realistic considerations may limit institution of these items of treatment, a minimal list of treatments is also presented.

A priority for rendition of treatment based on relative exigency is suggested.

## REFERENCES

1. Gruebbel, Allen O. Dental Services and Dental Personnel in State Health Departments. *J. Am. Dent. A.*, 32:1281-8 (Oct. 1), 1945.

2. Arnold, F. A., Jr. Discussion of Possibility of

Reducing Caries by Increasing Fluorine Ingestion. *J. Am. Coll. Dentists*, 12:61-2 (Mar.), 1945.

3. Knutson, John W., and Armstrong, Wallace D. The Effect of Topically Applied Sodium Fluoride on Dental Caries Experience. *Pub. Health Rep.*, 60: 1085-90 (Sept. 14), 1945.

## Arsenic in Soy Sauce

The San Francisco Department of Public Health, J. C. Geiger, M.D., Director, received notice on July 12 that soy sauce manufactured by a midwest packing company was contaminated with arsenic. According to Dr. Geiger, investigation indicated that much of the contaminated soy sauce had been blended and had reached the local market under various brands, 59 in all. Both retail and wholesale distribution of soy sauce was halted on July 14 and the public was warned of possible dangers. On July 19 the San Francisco laboratory reported studies of 59 known brands, and 32 of them were released for sale. The local press was advised of the names of the brands free of contamination. According to the department, of the contaminated material some of the

specimens contained from 0.06 grains of arsenic per pint ( $\text{As}_2\text{O}_3$ ) to as high as 10 grains per pint.

The source of contamination has been traced to a shipment of caustic soda from a chemical weed-killer producer to the soy bean sauce manufacturer through a broker. As soon as the sauce manufacturer heard of the illnesses traced to the soy bean sauce, samples withdrawn at various stages of preparation were analyzed. Samples taken at points following the addition of the caustic soda carried as much as 500 parts per million of arsenic. The manufacturer immediately supplied a complete list of all shipments which might have included the contaminated sauce, thus making it possible to trace suspected lots quickly.



# A Method for Assessing the Sanitizing Efficiency of Quaternary Ammonium and Hypochlorite Products\*

C. K. JOHNS, Ph.D., F.A.P.H.A.

*Bacteriologist, Division of Bacteriology and Dairy Research, Science Service,  
Department of Agriculture, Ottawa, Canada*

THE effectiveness of hypochlorite solutions as sanitizing agents for the washed surfaces of food handling equipment is generally recognized, and these solutions are widely used for this purpose. More recently a number of "surface active" agents of the quaternary ammonium or cationic type have been advertised as substitutes for hypochlorites for this and other purposes. The present studies were undertaken in the hope of throwing some light upon the comparative efficiency of these two types of compound.

While the quaternary compounds show quite high values for phenol coefficient by the F.D.A. technique, the validity of this method has recently been called into serious question.<sup>1, 2, 3</sup> In any event, there is room for doubt as to whether such a technique is best suited to the task of evaluating the relative sanitizing efficiency of various solutions.

Some years ago, when faced with the problem of assessing the comparative germicidal speed of various chlorine compounds, a number of different techniques, including modifications of the F.D.A. method for the determination of phenol coefficient, were tried out. In an endeavor to approximate more closely

the conditions under which a sanitizing solution has to do its work in actual practice, a glass slide method was finally developed which gave by far the most satisfactory results.<sup>4</sup> This method also permitted the use of very short periods of exposure to the germicidal solution, a point of considerable importance, since in many instances under practical conditions only a few seconds' contact is allowed. Preliminary tests showed that this glass slide technique, with slight modifications, could be used equally well with quaternary compounds, hence it was selected for the comparative tests to be reported in this paper.

## DESCRIPTION OF GLASS SLIDE TECHNIQUE

In the glass slide technique, a 20-24 hour growth of the test organism on an appropriate agar medium is washed off and suspended in sterile distilled water. After filtration through a No. 1 Whatman paper the suspension is standardized to match the turbidity of a suspension of *Staphylococcus aureus* giving a plate count of 200,000,000 per ml. One ml. of suspension is then introduced into 60 ml. of a 1:10 dilution of sterile skim milk in a container of such dimensions that the depth of the liquid is 1½".

A previously sterilized slide is dipped into the seeded skim milk suspension so that the lower half of the slide is immersed. It is then carefully drained

\* Presented before the Laboratory Section of the American Public Health Association, at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 12, 1946. Contribution No. 247 (Journal Series) from the Division of Bacteriology and Dairy Research, Science Service, Department of Agriculture, Ottawa, Canada.

against the rim of the container for approximately 10 seconds and placed upright to drain upon a pad of sterile filter paper in a specially constructed draining can. Sufficient slides to run the desired number of tests on a given dilution of a product are prepared consecutively, following which the tests are carried out before the films of diluted skim milk have dried over more than 25 per cent of the area.

Previous to preparing the slides, 100 ml. portions of the solutions to be tested have been prepared with sterile distilled water. These are placed in 100 ml. beakers and brought to the desired temperature in a water bath. The slide first prepared is then drained of any excess liquid on the filter paper, dipped into the test solutions and gently agitated for the required period, which usually runs between 1 and 20 seconds in the present studies. It is then quickly removed, dipped momentarily into a beaker of tap water to rinse off the adhering germicide and minimize bacteriostatic action, shaken sharply once to remove excess rinse water, placed in a Petri dish and the plate immediately poured with an appropriate agar medium. The remaining slides in the set are similarly treated in correct sequence. After an appropriate period of incubation, the colony count of each plate showing less than 500 colonies is made and recorded.

In the sanitizing of equipment, utensils, etc., we are usually more interested in reducing the numbers of organisms below a certain arbitrarily established limit than in complete sterilization. It was therefore decided to take as the end point approximately 99.9 per cent destruction. To arrive at this figure, control plates are prepared at regular intervals during each day's run by dipping sterile slides into a second container of diluted skim milk in which the concentration of test organisms is only 1/60 to 1/600 of that of the original

skim milk suspension. These slides are drained in the same manner as those treated with the germicide, then dipped momentarily in fresh tap water before plating. The average colony count on these control slides, multiplied by the appropriate factor, indicates the approximate number of organisms present on the regular slides before treatment. By dividing this figure by 1,000 a value is obtained representing the number of organisms remaining after 99.9 per cent have been destroyed.

#### ADVANTAGES OF GLASS SLIDE TECHNIQUE

Compared with the phenol coefficient technique, the most obvious advantage to the bacteriologist is the avoidance of the "skips" and "misses" which are so commonly encountered with that technique. Although irregularities are sometimes encountered, there is generally a steady drop in count with increasing period of exposure or increased concentration of germicide. Similarly, replicate runs conducted a week or more apart have generally indicated a satisfactory degree of reproducibility with this technique, as indicated by the data in Table 1. After all, it is reasonable to expect better agreement between replicate runs where 99.9 per cent destruction is taken as the end point than where the end point is taken as the killing of the last, most resistant, cell.

Another important advantage is that the glass slide technique more closely approximates the conditions under which a sanitizing agent has to work in actual practice. It measures the ability to kill organisms present on a surface in a film of organic matter, rather than freely suspended in the germicide. Furthermore, as a result of gentle agitation of the slide while immersed in the germicide, any superiority of a given product in detergent action has an opportunity to display itself and, by mechanical removal of the film and its accompanying

TABLE 1

*Germinical Potency of Various Sanitizing Agents Against Micrococcus candidus at 20° C.  
Replicate Determinations Conducted a Week Apart*

Product	Concentration p.p.m.	Period of Exposure (Seconds)											
		1			5			10			20		
		a	b	c	a	b	c	a	b	c	a	b	c
Reccal	200	+	++	++	+	0	1	29	0	2	8	0	0
	100	++	+++	+++	33	29	45	13	2	5	13	2	2
	50	+++	+++	+++	++	++	+	26	25	0	23	13	5
R-2-L	200	274	++	++	0	8	2	1	4	0	0	2	0
	100	++	+++	+	59	12	0	2	7	0	3	1	0
	50	++	+++	+++	++	+	+	27	24	37	15	15	18
Hyamine 1622	200	+	++	+	18	0	215	23	4	293	4	2	344
	100	+++	+++	++	34	23	39	13	46	24	7	25	37
	50	+++	+++	+++	+	+	+	32	163	20	14	96	16
Emulsept	200	++	++	++	25	127	6	8	48	1	10	41	3
	100	++	++	++	+	++	+	21	34	17	41	14	1
	50	+++	+++	++	+++	++	++	+	+	+	27	67	7
Daldish	200	+++	+++	++	+++	++	++	++	++	++	166	++	433
	100	+++	+++	++	+++	++	++	++	++	++	484	++	+
	50	+++	+++	+++	+++	++	++	++	++	++	169	+	+
Klenzade N4	200	+++	+++	++	+++	++	++	++	++	++	981	++	+
	100	+++	+++	++	+++	++	++	++	++	++	+	++	+
	50	+++	+++	++	+++	++	++	++	++	++	++	++	+

a—99.9% destruction leaves 91 colonies

b—“ “ “ 114 “

c—“ “ “ 62 “

bacteria, to reduce the number remaining on the slide.

Finally, attention should be drawn to the flexibility of this technique. The test organism, temperature of testing, period of exposure, concentration of germicide, plating medium, etc., may all be varied to suit the needs of the investigator.

EXPERIMENTAL

The products selected for comparative testing were representative of those on the market in Canada at that time, and included Roccal and R-2-L, both 10 per cent solutions of alkyl-dimethyl-benzyl-ammonium chloride, Hyamine 1622, di-isobutyl-phenoxy-ethoxy-ethyl-dimethyl-benzyl ammonium chloride in powder form, and Emulsept, a 10 per cent solution of N(acyl colamino formyl-methyl)pyridinium chloride. For comparison, two hypochlorites were selected. One, Dalglish Liquid Bleach, containing about 12 per cent available chlorine, is widely used throughout Eastern Canada. The other, Klenzade X4, is a newer product, said to be buffered to lower the pH and to render it more stable.

Time will not permit a detailed presentation of the results of these studies. They have included evaluation of the

comparative germicidal efficiency against each of the test organisms at 20°C., while with three of these similar comparisons have also been made at 45°C. In addition, the effect of adjusting the pH has been studied with both *Staphylococcus aureus* and *Escherichia coli*. To give a general idea of our findings, a Table 2 has been constructed showing the periods of exposure necessary to effect 99.9 per cent destruction of each of the test organisms with one of the three concentrations of germicide tested. While this presentation tends to magnify certain small differences, as compared with the tables containing the complete data, it still serves to indicate certain important differences between the two types of sanitizing agent. For example, it clearly shows that against *S. aureus*, *Micrococcus candidus* and spores of *Bacillus panis*, the hypochlorites are definitely less effective than are the quaternaries. Against the vegetative cells of *B. panis* they are approximately equivalent, while against cheese starter organisms the hypochlorites are definitely more effective. The results from tests with flat sour organisms (21 hr. cultures) indicated destruction of >99 per cent of the cells by Roccal within 5-10 seconds, and by Dalglish hypochlorite within 10-20 seconds. How-

TABLE 2

Periods of Exposure (Seconds) Required to Destroy 99.9 Per cent of Test Organisms at 20° C.

Gram positive Species	Conc'n p.p.m	Quaternary Ammonium Compounds				Hypochlorites	
		Roccal	R-2-L	Hyamine 1622	Emulsept	Dalglish	Klenzade X4
<i>S. aureus</i>	200	5	5	5	15	13	>20
<i>M. candidus</i>	200	5	5	5	7	>20	>20
<i>B. panis</i> — spores	1,000	3	1	1	15	>20	>20
— vegetative	100	5	5	1	5	1	5
Cheese starter	100	5	3	3	3	1	1
Flat sour organisms							
MI 23	200	>40	..	..	..	>40	..
1503	200	>40	..	..	..	>40	..
1518	200	>40	..	..	..	>40	..
Gram negative Species							
<i>E. coli</i>	200	15	10	>20	15	1	1
<i>S. typhimurium</i>	200	5	5	8	8	1	5

ever, the number of spores present was so great that the 99.9 per cent end point had not been reached after 40 seconds' exposure. The sharp differences in resistance to quaternaries shown by Hucker to characterize the spore forms are not evident in the vegetative cells.

With the Gram-negative species, *E. coli* and *P. aeruginosa*, the hypochlorites are definitely superior, the advantage being greater than that in favor of the quaternaries against *S. aureus*. Incidentally, it is interesting to note that while other workers have reported *P. aeruginosa* as being much more resistant to quaternaries than is *E. coli*, our results with the glass slide technique have shown *Pseudomonas aeruginosa* to be the more easily killed. A possible explanation for this may be that the *P. aeruginosa* cultures contained a few highly resistant cells, so that, although 99.9 per cent destruction is accomplished in a relatively short time, yet the destruction of the last surviving cell may require a much stronger concentration or a longer exposure period than was necessary for *E. coli*. This point requires investigation.

Tests conducted against *S. aureus* at 45°C. indicated that there was some enhancement of germicidal activity of the quaternaries at the higher temperature, but the effect was slight compared with that noted for the hypochlorites. On the other hand, against *E. coli*, the quaternaries showed a more marked increase in activity at the higher temperature. Adjustment of the reaction to around pH 10 stimulated the activity of the quaternaries against *S. aureus* more than against *E. coli*; however, the effect was slight compared with that shown by the hypochlorites in solutions adjusted to pH 6.

Although it is not so evident from the data in Table 2. Emulsept was almost invariably less effective than were the other three quaternaries, while Klenzade X4 was similarly less effective than Dalglish.

It will be noted that the time required to destroy 99.9 per cent of the test organisms with the glass slide technique is a very small fraction of that required to effect complete sterilization with the F.D.A. technique or its modifications. Since in the glass slide technique the cells are present in a film of diluted skim milk, it seems unlikely that this difference is due entirely to a lesser amount of organic matter present than in the F.D.A. method. More probably it is due to (a) the smaller number of cells to be destroyed (varying between 8,000 and 160,000 per slide), and (b) the fact that while a very high percentage of the cells is usually destroyed within the first few seconds, an occasional cell survives for several minutes. The numbers present in the film in the glass slide technique are considerably higher than might be expected on the surfaces of washed food handling equipment and utensils,<sup>5</sup> while the amount of organic matter in the film of skim milk is also much greater. It would seem reasonable, therefore, to expect equally rapid destruction in actual plant operations.

In view of the recent evidence of strong bacteriostatic action displayed by some quaternary ammonium compounds in the F.D.A. technique,<sup>1,2</sup> considerable attention was given to the possibility that bacteriostasis might affect the results obtained with the glass slide technique. It was found that with the higher concentrations (used against spores of *B. panis*), quite marked inhibition of growth of *S. aureus* resulted, even where treated slides had received the customary dip in tap water to reduce the carry-over of residual germicide. With a concentration of 200 p.p.m. the zone of inhibition rarely exceeded the area of the slide; with weaker concentrations it was scarcely noticeable. This bacteriostatic effect was confined to the three Gram-positive species tested, even 1,000 p.p.m. having no effect upon the Gram-

negative species. The bacteriostatic effect was usually confined to the area above and adjacent to the treated slide, the test organisms growing freely on the remainder of the plate. While this effect was quite evident on a crowded plate, by the time the number of colonies approached the 99.9 per cent end point it was usually difficult to see much evidence of bacteriostasis. Consequently, it is believed that any error introduced by the bacteriostatic effect is slight compared with that in the F.D.A. method, and it is unlikely that such error has influenced the results to a significant degree. From a practical standpoint, this effect may be regarded as an advantage in that the residual film of a quaternary solution on a treated surface could be expected to continue its activity against any remaining organisms.

#### SUMMARY

To recapitulate, the glass slide appears to offer certain advantages in the evalua-

tion of the efficiency of various types of sanitizing agents. Quaternary ammonium compounds, like chlorine compounds, show differences in their relative potency. In general, the former are more effective against the Gram-positive organisms, while the hypochlorites tested show an even greater advantage against the Gram-negative species tested. While the quaternary compounds show some responses to favorable adjustments in temperature and pH, these are much slighter than those shown by the hypochlorites.

#### REFERENCES

1. Klarmann, E. G. and Wright, E. S. An Inquiry into the Germicidal Performance of Quaternary Ammonium Disinfectants. *Soap & Sanit. Chem.* 22: 125-135 (Jan.), 1946.
2. Klarmann, E. G. and Wright, E. S. Quaternary Ammonium Germicides. *Soap & Sanit. Chem.* 22: 139-149, 163 (Aug.), 1946.
3. Reddish, Geo. F. Disinfectant Testing. *Soap & Sanit. Chem.* 22:127-129, 148C, (July), 1946.
4. Johns, C. K. The Evaluation of the Germicidal Potency of Chlorine Compounds. I. Hypochlorites. *Sci. Agr.* 14, 11:585-607 (July), 1934.
5. Scales, F. M. and Kemp, M. Internat. Assoc. Milk Dealers, *Assoc. Bull.* No. 8, 187-209, 1939.

#### ADDENDUM

Since this paper was prepared, the following modifications have been adopted: (a) instead of receiving only a momentary dip, treated slides are agitated in tap water for 5 seconds before being plated; (b) control slides are shaken vigorously 25 times in 100

ml. sterile physiological saline solution in a 4 oz. screw-cap jar, the slide itself is plated out and 5 ml. of the saline plated separately. From these the total number of organisms originally present on the slide is calculated and this figure used in determining the end point of 99.9 per cent reduction.

# Congenital Defects in a Year of Epidemic Rubella\*

R. E. OBER, M.D., R. J. M. HORTON, M.D., AND  
ROY F. FEEMSTER, M.D., DR.P.H., F.A.P.H.A.

*Epidemiologists and Director, Division of Communicable Diseases, Massachusetts  
Department of Public Health, Boston, Mass.*

A SUPPOSEDLY benign disease suddenly assumed much more serious aspects, when Gregg<sup>1</sup> in 1941 first reported the relationship between rubella in the pregnant woman and congenital defects in infants. As evidence accumulated, a number of serious congenital defects appeared to be directly attributable to the occurrence of rubella in pregnancy. The Australian cases reported by Gregg and others occurred following a large outbreak in 1940 in an area where the prevalence of rubella had been low for a number of years. The accumulation of a large number of susceptible adults resulted in many pregnant women becoming afflicted simultaneously. Realizing that this same situation might be occurring in Massachusetts, but unrecognized because of its relative infrequency, a survey was planned to determine if such anomalies appeared to be resulting from rubella in this state.

## SURVEY METHODS

The first step in this investigation was to send letters describing the problem to eighty well known specialists in the following fields: obstetrics, pediatrics, ophthalmology, and otolaryngology. All were asked whether they had observed in their practice specific defects in the

new-born such as had been previously described, and which could be attributed to rubella in the pregnant woman. Replies were received in the affirmative from six of these specialists enumerating a total of 10 such cases. Although only a few cases were thus discovered, it was felt that the problem warranted further study.

The second and most important phase of the study was an attempt to analyze the problem from a statistical viewpoint. The year 1943 was selected for such a study for several reasons: Nearly 35,000 cases of rubella had been reported to the department during that year, nearly twice the usual incidence; it was recent enough for individual memories to recall important facts; the children would be old enough for the anomalies to have been recognized at the time of the study.

The approximate number of females who had rubella in Massachusetts in 1943 was estimated from the list of reported cases for that year. It was found that 5,085 females in ages 15-49 inclusive had rubella in 1943. Since only 1 per cent of girls 15 and 16 are married in Massachusetts, the omission of those under 17 decreased the number to be surveyed to nearly 3,000. A complete list of the females in the age group 17-49 was compiled from the original report cards sent in daily from local boards of health.

\* Presented before the Epidemiology Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 12, 1946

The notification of communicable diseases from the various communities in the state list the name, address, age, and sex of the individual so reported. Marital status is not usually given. Accordingly, our list of adult female cases contained no information regarding marital status. Realizing all of the difficulties which would be encountered in seeking information from these individuals, various approaches to the problem were attempted. First, four communities were selected which have large, active health departments, coöperating closely with the State Department. They were asked to investigate the cases listed for their communities. This did not prove to be a satisfactory method even in these communities because of the lack of properly trained personnel who could devote the necessary time to the problem. It would have been even less satisfactory in the smaller cities and towns in the state. A brief trial of collecting information personally by departmental employees disclosed that the method was too time-consuming. The only practicable method seemed to be to canvass the group by mail.

A small pamphlet was prepared describing in simple understandable terms the purpose of the survey and the reason for requesting the information. This pamphlet was mailed to each woman on the list, and a return postal card was enclosed which was to be filled out and returned to the department. Each postal card was marked with a code number corresponding to the name of the woman in our file, so that she could be identified without signing the card. The first question on the card asked if the woman was married at the time that she had rubella in 1943. If the answer was negative, the remaining questions were not to be answered. As might be expected, some who did not read the pamphlet and card carefully became irate and wrote sarcastic replies. Fortunately, the vast majority who replied appeared to

have understood the purpose of the card, and filled it out satisfactorily. A second card was enclosed to be given to an acquaintance who had had rubella while pregnant, if any such cases were known. This card, of course, had to be signed and returned to the department in an envelope. A follow-up letter was sent out at a later date to those women who failed to respond to the first questionnaire.

As a third step in the investigation, a letter was sent to approximately 6,000 physicians in the state, and to several institutions for the care of defective children, asking for information that they might have on rubella during pregnancy. Since rubella is not well reported, it was thought that some unreported cases of the disease during pregnancy might be found in this way and that information might be obtained in regard to women who did not reply to the questionnaire. This portion of the survey is not yet completed.

#### RESULTS OF THE SURVEY

Table 1 shows the response to the survey by mail of the reported cases in females. No questionnaires were sent to women who were obviously college or nursing students or inmates of institu-

TABLE 1

*Response to Questionnaire Regarding Rubella in Pregnancy Sent to Women Ages 17-49*

*Massachusetts, 1946*

German Measles in females 17-49	3,068
Questionnaire not sent	234
Not located	45
No reply	1,625
Total	1,904
Replied to Questionnaire	1,164
Error in reporting	19
Not married	658
Married but not pregnant	438
Pregnant at time of infection	49 *
Total	1,164

\* Five other cases revealed by supplementary methods



TABLE 2

*Cases of Rubella in Pregnancy Revealed by Mail Survey in Females Ages 17-49  
Massachusetts, 1946*

Case No.	Year Reported	Month of Pregnancy	Defects in Child	Remarks
1	1941	1	bilateral cataracts	
2	1943	1	microcephaly	
3	1943	1	bilateral cataracts	Aborted at 4½ months
4	1943	1	heart lesion	Aborted at 3 months
5	1943	1	?	
6	1943	2	none	
7	1943	2	none	
8	1943	2	?	Stillborn at term
9	1943	2	heart lesion	
10	1943	2	bilateral cataracts	Term birth
11	1943	2	heart lesion	(wt. 3 lbs. 12 oz.)
12	1943	2	none	
13	1943	2	none	
14	1943	2	?	Stillborn at about 7 mo.
15	1935	3	deafness	
16	1943	3	none	
17	1943	3	none	
18	1943	3	?	Aborted at about 4 mo.
19	1943	3	none	
20	1943	3	none	
21	1943	3	none	
22	1943	3	none	
23	1943	3	?	Aborted during 3d month
24	1943	4	none	
25	1943	4	none	
26	1943	4	?	Aborted during 4th month
27	1943	4	none	
28	1943	4	feeding problem	
29	1945	5	none	About 2 months premature
30	1943	5	none	
31	1943	5	none	
32	1943	5	none	
33	1943	5	none	
34	1943	5	none	
35	1943	5	none	
36	1943	5	none	
37	1945	5	none	
38	1943	6	none	
39	1943	6	none	
40	1943	6	none	
41	1943	6	none	
42	1943	6	none	
43	1943	6	alternating strabismus	
44	1943	7	none	
45	1943	7	none	
46	1943	7	none	
47	1943	7	none	Stillborn at term (autopsy)
48	1943	7	none	1 month premature
49	1943	7	none	
50	1946	7	none	
51	1943	8	?	Stillborn during 8th month
52	1943	9	none	(no autopsy)
53	1943	9	none	
54	1943	9	heart lesion	
55	1943	9	none	

tions. This eliminated 234 names from the list. Of the 2,834 women to whom the questionnaire was sent, 1,164 (41 per cent) replied. Replies from the original questionnaire totaled about 25

per cent, the remainder being elicited by the follow-up letter. The errors in reporting were mainly in age or diagnosis.

Of the 1,164 women who responded

to the questionnaire, 438 (38 per cent) were married at the time of their infection; 49 (11 per cent) of those who were married were pregnant when they had rubella. In addition, 5 cases of rubella in pregnancy which occurred in years other than 1943 were brought to our attention; 2 were sent to us by local health departments, and 3 responded to the second questionnaire card mentioned above.

The 54 cases discovered in this portion of the investigation are presented in Table 2. We are unable to account for the small number of cases which were reported in the last 2 months of pregnancy.

The congenital defects reported in cases 1, 2, 6, 8, 9, and 53 are typical of those previously reported as following maternal rubella. The defects listed for cases 27 and 42 are both commonly found in infants, and their relationship to the maternal infection might be questioned. We have included them in this table as defects for several reasons: Swan, et al.<sup>4,5,6</sup> have reported several cases of defective infants following maternal infection in the second trimester of pregnancy; the same authors have reported strabismus among the defects found in their cases; several authors have mentioned the occurrence of feeding problems among their cases. No defects were found in this series fol-

lowing maternal infection in the last trimester.

In Table 3, it will be seen that, of the 5 women who had rubella during the 1st month of pregnancy, 2 aborted, 2 had defective infants, and 1 infant was normal; thus 80 per cent of the infants were either lost or defective. In the 2nd month, 2 infants were stillborn, 2 were defective, and 4 were normal, or 50 per cent were lost or defective. In the 3rd month, 2 aborted and 1 was defective, with 6 infants normal, or one-third of the infants lost or defective. In the 4th month, there were 1 abortion and 1 defective child, with 3 infants normal; an incidence of 40 per cent lost or defective. In the remainder of pregnancy there were: 1 minor defect in the sixth month; 2 stillbirths which occurred in the seventh and eighth months; 1 defective infant for which the month of pregnancy was not known. In the 54 cases, there were 8 defective infants and 9 pregnancies which terminated in abortion or stillbirth.

Only 628 replies have as yet been received to the questionnaires which were sent to physicians in the state. Of these, 39 had treated approximately 170 cases of rubella in women of child-bearing age in 1943. Thirteen of these women had been pregnant at the time of their infection. Data on 4 of these cases were incomplete; 5 of the 8 cases

TABLE 3  
*Cases of Rubella in Pregnancy Revealed by Mail Survey in Females Ages 17-40  
Massachusetts, 1946*

Month of pregnancy	Normal Infants	Defective Infants	Abortion or Stillbirth	Total Lost or Defective
1	1	2	2	4 (80%)
2	4	2	2	4 (50%)
3	6	1	2	3 (33.3%)
4	3	1	1	2 (40%)
5	5	0	0	0
6	1	1	0	1 (20%)
7	0	0	1	1
8	0	0	1	1
9	2	0	0	0
10	1	1	0	1
11	3	0	0	0
12	1	1	0	1
Total	37	8	9	17 (31.6%)

TABLE 4

*Cases of Rubella in Pregnancy in Massachusetts Study, Combined with Those Reported by Fox and Bortin and Aycock and Ingalls*

Trimester of Pregnancy	No. of Cases	Defective Infants		Abortions and Stillbirths		Total Lost and Defective	
		No.	Per cent	No.	Per cent	No.	Per cent
First	40	13	32.5	7	17.5	20	50.0
Second	22	2	9.1	1	4.6	3	13.6
Third	14	0	...	2	14.3	2	14.3
Unknown	2	1	...	0	...	1	50.0
Totals	78	16	20.5	10	12.8	26	33.3

in the first trimester had defective infants, in 1 case there was an abortion, and only 2 infants were normal. The single case reported in the third trimester produced a normal infant.

We were disappointed that physicians failed to remember or report more cases of rubella in the second and third trimesters of pregnancy. It does not seem plausible that rubella selects women in the first trimester of pregnancy. Undoubtedly the knowledge that important defects occur during that period focused attention on those who were most likely to show abnormalities.

#### DISCUSSION

Although a large number of cases of congenital defects following maternal rubella have been reported, the majority of these have been discovered by investigating pregnancies which resulted in defective infants. This may have given a distorted view of the incidence of defective offspring from pregnancies during which the mother has contracted rubella. Two recent surveys have approached the problem with the purpose of determining the proportion of defective children which might be expected from such pregnancies. These surveys of Fox and Bortin<sup>2</sup> and of Aycock and Ingalls<sup>3</sup> included 15 cases. All of the defects observed were in instances in which the rubella had occurred during the first trimester of the pregnancy. Of the 11 cases which occurred in the first trimester, 3 showed defects, an incidence of 28 per cent, compared to 23 per cent

in the present survey. A 4th infant was stillborn, giving a total of 6 (25 per cent) lost and defective infants, compared to 50 per cent in Table 3.

In Table 4, we have combined the 54 cases from this study, 11 cases from Fox and Bortin, and 4 cases from Aycock and Ingalls. The data are given by trimester rather than by month in order to include the largest possible number of cases. The total proportion of infants lost and defective for the three periods is: 50 per cent for the first; about 14 per cent each for the second and third. It is interesting to note in comparison that the data presented on the effects of poliomyelitis in pregnancy by Aycock and Ingalls show a somewhat similar proportion of lost and defective infants, namely, 56 per cent, 26 per cent, and 14 per cent for the three periods. However, the proportion lost by abortion and stillbirth after poliomyelitis is much higher, and the number of defectives much lower. The figures given in Table 4 for the total period of pregnancy are probably not a very close approximation to the true picture due to the small number of cases in late pregnancy. Undoubtedly, the lack of reported defects in late pregnancy causes observers to overlook instances of rubella late in the period.

With the exception of Aycock and Ingalls,<sup>3</sup> no previous authors have emphasized that abortions and stillbirths may result from infection of the pregnant woman with rubella. The frequent interruption of pregnancy by other more

serious diseases is well known. It is apparent from the data presented here that the interruption of pregnancy as a sequel to maternal infection with rubella is frequent enough to deserve further investigation. The number of abortions and stillbirths uncovered in our survey is as large as the number of defective children.

A definitive study of the effects of rubella and other diseases during pregnancy on the resulting child has yet to be done. Such studies would involve finding cases while the mother is ill with the disease, verifying the diagnosis and the stage of pregnancy, following the pregnancy to its conclusion, obtaining careful autopsies on all infants lost by abortion or stillbirth, and following up infants to the age of 12 to 15 years, if necessary, to catch all important abnormalities. This type of investigation would be of considerable value, but would take a number of years to complete. Meanwhile, it is necessary that estimates of the gross effects on the fetus of maternal disease during pregnancy be determined as rapidly as possible. As suggested by Fox and Bortin,<sup>2</sup> more surveys of this type are needed for rubella. The total of 78 cases so far reported, which have been collected on a comparable basis, give some indication of the incidence of defective infants to be expected following maternal infection with this disease. The addition of more cases from other similar surveys would greatly strengthen the inferences which can now be made. Except for poliomyelitis, no information is available as yet on the incidence of defects after other diseases, although several are known to cause such defects.

In spite of the striking incidence of abnormalities of pregnancy during the first trimester, we must be cautious in

attributing a causal relationship to rubella for all the defects found in this survey. We can be sure that some of them would have occurred if the mothers had not had rubella. Comparisons are needed with outcomes of pregnancies not complicated by communicable diseases as well as with those complicated by other virus and bacterial diseases.

#### SUMMARY

1. The results of a survey of adult females who had rubella in 1943 to determine the effects of the disease on infants are outlined and discussed.
2. Of 54 pregnancies discovered in replies to questionnaires sent to females 17-49 years of age, infants with abnormalities were observed in 8, abortions or stillbirths occurred in 9. Eleven of the 17 abnormal pregnancies were in women who contracted rubella during the first trimester.
3. Of 9 pregnancies reported by physicians in response to questionnaires, only 3 produced normal infants. Eight of the 9 women, however, contracted rubella in the first trimester.
4. Caution should be observed in attributing all such defects in infants to rubella.
5. The need of more comprehensive surveys to determine the comparative incidence of abnormal pregnancies in other virus and bacterial diseases as well as abnormalities in pregnancies not complicated by communicable diseases is discussed.

#### REFERENCES

1. Gregg, N. McA. Congenital Cataract following German Measles in the Mother. *Tr. Ophth. Soc. Aust.*, 3:35, 1941.
2. Fox, M. J. and Bortin, M. M. Rubella in Pregnancy Causing Malformations in the Newborn. *J. A.M.A.*, 130:568 (March 2), 1946.
3. Aycock, W. L. and Ingalls, T. H. Maternal Disease as a Principle in the Epidemiology of Congenital Anomalies. *Am. J. M. Sc.*, 212:366 (Sept.), 1946.
4. Swan, C., et al. Congenital Defects in Infants following Infectious Diseases during Pregnancy. *M. J. Australia*, 2:201 (Sept.), 1943.
5. Swan, C., et al. Congenital Defects in Infants following Infectious Diseases during Pregnancy, with Special Reference to Rubella. *M. J. Australia*, 1:409 (May 6), 1944.
6. Swan, C., and Tostevin. Congenital Defects in Infants following Infectious Diseases during Pregnancy, with Special Reference to Rubella. *M. J. Australia*, 1:645 (May 11), 1946.

# Public Health Aspects of Dehydrated Foods\*

## Food and Nutrition Section

SINCE the termination of hostilities, production of dehydrated foods has shown a decrease due primarily to cancellation of government contracts. Thus, production of dehydrated vegetables for the fiscal year 1945-1946 has been estimated at approximately 91,300,000 lbs.; this figure does not include production for army procurement. If this were included, the total would probably be about 100,000,000 lbs., compared with 196,041,000 lbs. for the fiscal year 1944-1945.

Production of dried eggs for 1943, 1944, and 1945 is given in Table 1.

TABLE 1

*Dried Egg Production in the United States\**

Year	Whole lbs.	Albumen lbs.	Yolk lbs.	Total lbs.
1943	252,903,000	2,093,000	6,976,000	261,972,000
1944	311,369,000	2,310,000	7,063,000	320,742,000
1945	96,988,000	1,710,000	7,164,000	105,862,000

\* Bureau of Agricultural Economics, U. S. Dept. Agr.

Dried egg production (whole, albumen, yolk) during the first 5 months of 1946 amounted to 64,528,000 lbs., compared with 77,236,000 lbs. for the first 5 months of 1945.

Although production of dehydrated foods has shown a tendency to decrease in post-war months, it is still an important segment of the food industry. The committee has therefore deemed it ad-

visable to bring together the more pertinent information published since the report<sup>1</sup> of the committee.

### DEHYDRATED VEGETABLES

There have been no further publications on the bacteriological aspects of dehydrated vegetables since those cited in the committee's report in 1946.<sup>1</sup>

Considerable work has been undertaken on the sulfuring of vegetables (particularly cabbage, potatoes, and carrots) to preserve their keeping qualities and vitamin C content better.<sup>2,3</sup> Sulfite does, however, destroy thiamine.<sup>4</sup> The Russians apparently had used the method before it was commercially applied in the United States, as evidenced by a report by Sisakyan just recently available.<sup>5</sup> In this connection, the committee Chairman has received from D. I. Spiridonov his book (in Russian) on "Concentrated Foods" which not only includes the Russian technique of dehydration, but their technological methods of preparing concentrated foods.<sup>6</sup>

The latest data relative to the nutritive value of commercially dehydrated fruits and vegetables have been set forth by Pavcek, et al.<sup>7</sup> Mallette and his co-workers<sup>1</sup> have also published a well planned investigation on the nutritive value of commercially dehydrated vegetables.

\* Progress Report of the Committee on Foods (Except Milk).

COMMITTEE ON FOOD (EXCEPT MILK)

Organized 1932. Published reports: *Year Books* 1933-1934, 1934-1935, 1935-1936, 1936-1937, 1937-1938, 1939-1940, 1940-1941, *A.J.P.H.*, July, 1945, Mar., 1946

Mahoney, et al.<sup>8</sup> have carried out experimental work on the vitamin content of canned, frozen, and dehydrated peas. The peas were laboratory processed. After 6 months' storage (temperature not given) of the dehydrated product, vitamin C levels amounted to 20 per cent of the original content; when stored under carbon dioxide, the peas had a higher level of vitamin C than when stored in air or in a vacuum. Vitamin C retention on the basis of dry weight, of the stored products, after cooking was 19 per cent as compared with the original content. The dehydrated peas retained about one-half of their original thiamine content during 6 months' storage. A recent paper by Mallette, et al.<sup>4</sup> indicates that commercially dehydrated cabbage, white potatoes and sweet potatoes, when stored for a year maintained their vitamin potency, with the exception of vitamin C. Patton and Comin<sup>9</sup> stored dehydrated foods in sealed and unsealed containers for 6 months at 75-80° F. They obtained no consistent effect on the loss of carotene and thiamine in peas, corn, wax beans, peaches, and plums during storage with different types of containers. Carotene was lost more rapidly than was thiamine.

#### DRIED EGGS

Bacteriological workers in this field have concentrated their efforts on the study of organisms of the *Salmonella* group. The public health significance of this group has already been discussed at length.<sup>1</sup> Winter and coworkers in a recent paper<sup>10</sup> determined pasteurization times and temperatures necessary to destroy different *Salmonella* types in liquid whole eggs. It was found that these organisms were not difficult to destroy. *S. senftenberg* and *S. cerro* were found to be the most resistant types, and *S. pullorum* the least resistant. The resistance of *S. senftenberg* differed with the strain. These workers found that

*Salmonellas* of the types *S. pullorum*, *S. oranienburg*, *S. montevidео*, *S. tennessee*, *S. anatum*, *S. bareilly*, *S. typhimurium*, *S. meleagridis*, *S. london*, *S. newington*, *S. derby*, *S. rubislaw*, *S. oregon* and *S. kentucky* were destroyed in liquid whole egg at 150° F. within 0.3 minutes; at 148° F. 0.8 minutes; at 146° F. 0.8 minutes; at 144° F. 1.2 minutes; at 140° F. 2.6 minutes, and at 138° F. within 3.7 minutes. At the higher temperatures of 148° and 150° F. there would seem to be some danger of film formation in the pasteurizer. Payawal, et al.<sup>11</sup> found that the region of denaturation of liquid whole egg, as determined viscometrically, occurred within the range of 132.8° F. to 150.8° F. Above 163.4° F. whole egg coagulates almost instantaneously.

McFarlane, et al.<sup>12</sup> have presented data and have discussed the bacteriological methods used in the examination of egg samples, and conditions which may affect bacterial counts during handling and processing. In a later paper<sup>13</sup> these workers indicate measures of sanitation necessary for the production of a clean dried egg product.

Although there are no bacteriological standards for dried egg, as pointed out by McFarlane and coworkers<sup>12</sup> agencies of the U. S. Department of Agriculture concerned with the production and purchasing of dried eggs are encouraging manufacturers to produce a commodity having a plate count (72 hr. incubation at 32° F., using tryptone-glucose-extract agar) under 300,000 organisms per gm.; a direct microscopic count under 15,000,000 per gm., and with *Escherichia coli* absent in 0.001 gm. A direct count of 10,000,000 per gm., or under for a high quality powder is in accord with observations of Bartram<sup>14</sup> and of Lepper, et al.<sup>15</sup>

#### DEHYDRATED FISH

As pointed out in the committee's last report,<sup>1</sup> there is no commercial

production of dehydrated fish in the United States. Considerable work has been undertaken in Great Britain on fish dehydration. The results of the bacteriology of dehydrated fish have recently been published by Shewan,<sup>16</sup> who found that a dehydrated product made from good quality material under reasonable hygienic conditions was not sterile but might contain up to 100,000 organisms per gm. The flora consists chiefly of micrococci, and of the cocci growing at 37° C., 0-29 per cent are coagulase-positive and hence potentially capable of producing enterotoxins. This is of considerable public health importance because the most suitable way of utilizing dehydrated fish is by incorporation with potatoes in the form of fish cakes. Since starch media are excellent for enhancing the production of staphylococcal enterotoxins, and since Shewan found that growth occurs in such fish cakes even at 15° C., it would appear that cakes made from dehydrated fish should never be kept unfried in a warm room, but should be cooked immediately.

Tarr<sup>17</sup> has recently published results of his latest work on the microbiology of dehydrated fish. His data indicate that precooked fish, during dehydration, becomes contaminated with bacteria, molds, and yeasts. Mold development was apparent in dehydrated fish stored at 25° C. when the moisture content of the product became 16.8 to 18.3 per cent. Mold also developed, although not visible macroscopically, at moisture contents of 13.2 to 13.6 per cent. In two samples of 19 to 19.7 per cent moisture, the number of viable bacteria decreased sharply during storage, while a third sample showed a slight apparent increase. Both total volatile base and trimethylamine increased markedly in dehydrated fish stored at certain humid-

ities at which viable bacteria and molds decreased.

#### REFERENCES

1. Report of the Committee on Foods (Except Milk). Public Health Aspects of Dehydrated Foods. *A.J.P.H.*, 36: 248-60, 1946.
2. Mackinney, G. The Sulfiting of Vegetables. *Fruit Products J.*, 24: 300-1, 1945.
3. Beavens, E. A., and Bourne, J. A. Commercial Sulfiting Practices. *Food Indust.*, 17:1044-5, 1945.
4. Mallette, M. F., Dawson, C. R., Nelson, W. L., and Gortner, W. A. Commercially Dehydrated Vegetables. Oxidative Enzymes, Vitamin Content, and other Factors. *Indust. & Engin. Chem.*, 38:437-41, 1946.
5. Sisakyan, N. M. Drying of Vegetables and Potatoes with Preservation of Vitamin C. *Biokhimiya.*, 8:254-68, 1943.
6. Spiridonov, D. I. *Concentrated Foods*. Moscow-Leningrad, 1942, 170 pp. (in Russian).
7. Pavcek, P. L., and Committee on Food Composition. Nutritive Value of Dehydrated Vegetables and Fruits. *Indust. & Engin. Chem.*, 38:853-56, 1946.
8. Mahoney, C. H., Walls, E. P., Hunter, H. A., and Scott, L. E. Vitamin Content of Peas. *Ibid.*, 38: 654-57, 1946.
9. Patton, M. B., and Comin, D., The Effect of Storage upon the Vitamin Content of Dehydrated Fruits and Vegetables. Ohio Agr. Expt. Sta. *Bi-monthly Bull.*, 30, 157-63, 1945.
10. Winter, A. R., Stewart, G. F., McFarlane, F. H., and Soloway, M. Pasteurization of Liquid Egg Products. III. Destruction of Salmonella in Liquid Whole Egg. *A.J.P.H.*, 36:451-60, 1946.
11. Payawal, S. R., Lowe, B. and Stewart, G. F. Pasteurization of Liquid-Egg Products. II. Effect of Heat Treatments on Appearance and Viscosity. *Food Research*, 11:246-60, 1946.
12. McFarlane, V. H., Watson, A. J., and Goresline, H. E. Microbiological Control in the Production of Spray Dried Whole Egg Powder. *U. S. Egg. & Poultry Mag.*, 51(6):250-7; 270-85, 1945.
13. McFarlane, V. H., Watson, A. J., and Goresline, H. E. Sanitation in Egg Drying. *Ibid.*, 51(8): 364-8, 1945.
14. Bartram, M. T. Bacteriological Changes during the Dehydration of Eggs. *J. Bact.*, 45(1):48, 1943.
15. Lepper, H. A., Bartram, M. T. and Hillig, F. Detection of Decomposition in Liquid, Frozen and Dried Eggs. *J. Assoc. Off. Agr. Chemists.*, 27:204-23, 1944.
16. Shewan, J. M. The Bacteriology of Dehydrated Fish I Qualitative and Quantitative Studies of the Drying Process. *J. Hyg.*, 44:193-209, 1945.
17. Tarr, H. L. A. Water, Microorganisms and Volatile Bases in Dehydrated Fish. *J. Fisheries Res. Board Canada*, 6:303-10, 1945.

HARRY W. VON LOESECKE, *Chairman*  
 FRANK L. GUNDERSON, Ph.D.  
 GEORGE J. HUCKER, Ph.D.  
 D. BREESE JONES, Ph.D.  
 H. D. KRUSE, M.D.  
 ROE E. REMINGTON, Ph.D.  
 R. C. SHERWOOD, Ph.D.

# American Journal of Public Health and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 37

October, 1947

Number 10

---

## Editorial Board

REGINALD M. ATWATER, M.D.  
*Chairman and Managing Editor*

LEONA BAUMGARTNER, M.D.  
MARTIN FROBISHER, JR., D.Sc.  
PROFESSOR JOHN M. HENDERSON

RALPH S. MUCKENFUSS, M.D.  
STUART MUDD, M.D.  
RAYMOND S. PATTERSON, Ph.D.

C.-E. A. WINSLOW, Dr.P.H.

C.-E. A. WINSLOW, Dr.P.H., *Editor*

AUGUSTA JAY, *Editorial Associate*

---

## ADMINISTRATIVE PROBLEMS OF INDUSTRIAL MEDICINE

THE Special Review Article presented in this issue by Dr. L. J. Goldwater opens up what is perhaps the most complex and difficult problem to be found anywhere in the wide field of health and medical administrative policy; and the ultimate answer is, as yet, far to seek.

There are at least seven more or less distinct functions involved in the promotion of industrial health which may be listed as follows:

1. The provision of a healthful environment, including not only protection against specific accident and poison hazards but sanitary facilities, air conditioning, illumination, and other conditions essential for health and efficiency.
2. The education of the employed individual in the general principles of personal hygiene, particularly as adapted to the specific conditions of his employment.
3. Preemployment examination to determine the suitability of a given individual for his specific task.
4. Prompt diagnosis of new conditions requiring medical attention, whether of occupational or non-occupational origin.
5. First aid for such conditions as arise suddenly within the plant.
6. Treatment of disease, on a non-emergency basis.
7. Rehabilitation of the individual who, on account of partial disability, may require special preparation for and adjustment to, productive activity.

For the provision of these seven types of service, there are four different agencies in the picture: industry, labor, the medical profession, and the public; and any two or more of these agencies may coöperate in solving parts of the problem. The possible complexities of administrative relationship stagger the imagination.

In the past, enlightened industry has taken the lead in this field. In some large plants all seven of the functions listed are performed under the direction of management and with excellent results. In most large industries, some provision is made for the first five of these functions. Of late, organized labor has assumed an increasing role. The inclusion of health and welfare clauses in labor-management agreements is likely to become routine practice in many well-organized industries, and some of the stronger unions are already building up highly developed medical services for their members under labor auspices,



creating new vested interests which may be difficult to reconcile with a broad and all-inclusive program.

So far as the medical profession is concerned, it is difficult, as Dr. Goldwater points out, for the individual practitioner to fit into a comprehensive plan; and it is clearly impossible to visualize any such program on a fee-for-service basis. Prepayment is essential to adequate medical care for the middle economic groups of our society; and such care can only be provided with economy and efficiency on the basis of group practice. By the adoption of these two devices the medical profession can render the real service of which it is capable.

The public comes into the picture in two ways. We have pointed out that large industries have, in certain instances, come close to solving the problem by themselves. For the small industry, however, such a solution is impossible. Only through the leadership of the health department (or, in some communities, by that of a university medical center) can the small factory receive the preventive health and medical service which it so sorely needs. We look for substantial progress along this line as the health departments of our cities awake to their opportunities. The second contribution which the public will ultimately—in spite of misguided opposition—make to this picture will be through the passage of legislation for the prepayment of the costs of medical care.

Management, labor, the medical profession, and the public all have their stake in the outcome; and none of them can be left out of an ideal program. Yet, after all, the individual worker is at the center of the picture. He, or she, is a human being. He, or she, needs coördinated personalized health facilities, health education, and medical care. We must not cease to strive for a unified program directed toward an individual who is the same individual, whether within the walls of the factory or at home. Furthermore, the industrial worker is generally a member of a family; and his health care and health counseling should be correlated with that available for the other members of the family of which he forms a part.

There is a certain essential distinction between the first two and the last five of the specific functions listed above. Provision of healthful conditions within the factory walls and educational adjustment of the individual worker to those conditions are primarily problems of the industrial community itself. We may perhaps visualize as a promising avenue of approach a program in which a specialist in industrial hygiene would be primarily in charge of these functions. In a large plant he would be responsible to management—or, better, to a joint committee representing management and labor. In small plants, he might be an employee of the local health department, preferably with an advisory committee representing labor and management.

The other five functions, from preemployment examination at one end of the chain to rehabilitation at the other, involve problems primarily related to the individual worker. They could ideally be performed by a group practice unit of the medical profession acting under a prepayment plan. The preventive and curative aspects of the program should be tied together, however, by the co-operation of the specialist in industrial medicine as an associated member of the group practice unit. Where the group practice unit has sufficiently far-sighted medical administrative leadership, the group might, on its own initiative, supply to the industry its preventive as well as its curative service.

There is no single, perfect solution of this problem now in sight. There is rather a challenge to the inventiveness of management, labor, the medical profes-

sion, and the public to find empirically the best plan that will fit a given local situation. For management and labor, the need for coöperation in the meeting of a common problem is called for rather than insistence on vested interests. For the medical profession, it seems certain that the principles of group payment and group practice must be essential to any sound solution. For the public health authorities, leadership in research, formulation of reasonable standards of attainment, and assistance to small industries, where desirable, would appear to be the appropriate role.

## THE PROBLEMS OF CHRONIC ILLNESS

THE development of a broad and comprehensive program for dealing with chronic illness is clearly one of the outstanding challenges to the public health worker of today; and we are printing in the present issue of the *Journal* what is probably the clearest and most authoritative brief analysis of this problem which has yet been formulated. The joint statement of recommendations on "Planning for the Chronically Ill" has been prepared by a conference committee representing the American Hospital Association, the American Medical Association, the American Public Welfare Association, and our own Association. We commend it to the serious consideration of our readers.

The first step in this program is, of course, prevention. Tuberculosis and cancer are obvious examples of diseases which can be checked before they become chronic. The report does not mention streptococcosis, but we suspect that the streptococcus and the treponema lay the groundwork for many a case of circulatory disease in later life; and that the health officer who does not conduct a special program for the control of streptococcal diseases is missing a good bet.

The second essential is provision of hospital facilities for the care of chronic diseases at the stage when intensive medical care is needed; but a type of medical care with facilities for physiotherapy, occupational therapy and the like which a general hospital very often lacks and which, on the other hand, does not require much of the equipment which makes the general hospital so costly. Recognition of the fact that chronic diseases require facilities of a special kind has, however, too often led the unthinking to propose chronic disease hospitals set up as completely independent institutions, often in remote and isolated areas. This is a most unwise course. It deprives the chronic patient of the best type of medical service and it deprives the medical staff of the general hospital of invaluable experience with this most important group of diseases. The chronic disease hospital should be a specially equipped unit; but, as the Joint Report points out, "Hospital facilities for long-term illness should be built in the very closest relation to teaching centers and general hospitals."

A third essential element in the program is the nursing home for the type of patient who does not need active and continuous medical care but who cannot—for one reason or another—be cared for in the dwelling. For this purpose, public and private nursing homes should be provided under a system of licensure and inspection which is far more intensive and constructive than that now generally in force. Too often the licensing of nursing homes is carried out by state and local health departments in a purely perfunctory fashion, as a routine response to laws which require licensure of institutions which the health officer considers as unimportant, if necessary, evils.

Finally, the Joint Report considers that "the majority of persons who are chronically ill can best be cared for in home, office, and clinic." Here, the major need is for expansion of public health nursing to approach the essential ratio of one nurse per 2,000 population and for the improvement of the quality of nursing service provided. A specialized supervisor for this type of bedside care is perhaps as important as a specialized supervisor for tuberculosis nursing.

The Report emphasizes the vital importance of treating this whole subject as a branch of medicine and public health and not as a form of poor relief. One system of medicine for the poor and another system for the rich is an intolerable anachronism. It is impossible to build up a sound institution for the care of chronic illness, or to attract patients to such an institution if any suspicion of indigence is involved. We doubt whether this difficulty can be overcome until such services are transferred from welfare auspices to those of the health department or the community hospital.

It is a most favorable omen for such planning that the four major professional organizations concerned with this field should have united in so admirable a report. We congratulate our own Subcommittee on Medical Care for its contribution to this important task.

## TRAINING HEALTH WORKERS FOR LATIN AMERICA

At a meeting of the Institute of Inter-American Affairs last winter, Dr. T. I. Gandy, Chief of the Institute's Field Party in Chile, presented a review of the progress made in training health workers for our southern Sister-Republics which was at once a record of distinguished past achievement and a challenge for the future.

Dr. Gandy points out that "Following the Conference of Foreign Ministers held in Rio de Janeiro in 1942, the republics of Central and South America and Mexico suddenly realized that one of the largest inter-American programs in public health was under way. Within a short time health centers, hospitals, sewerage and water works were being constructed from Mexico to the landlocked islands of southern Chile, and from the Atlantic to the Pacific. The mighty Amazon basin was explored and control measures were instituted for malaria, leprosy, yaws and other tropical diseases. The personnel of the Institute of Inter-American Affairs was soon to be found in every country and climate of this hemisphere in their effort to reduce diseases, increase health standards, and to bring to many people their first knowledge of the meaning of public health."

The scarcity of trained professionals in the various fields of public health was immediately realized; and, through the leadership of Dr. George C. Dunham, a Training Division was organized by the I.I.A.A. for the purpose of bringing selected candidates to various institutions of higher education in the United States. During the past four years, hundreds of professional men and women from Latin America have received training here under its auspices and, upon return to their respective countries, have been appointed to key posts in the public health field.

This training program has, of course, been on a temporary emergency basis. It will always be true that a few mature men will benefit greatly by training in a foreign country; and there should be facilities in our schools of public health

for exceptional cases of this kind. Dr. Gandy, however, points out that, for reasons of economy, to minimize language difficulties, and to adapt the educational process to local needs and social conditions, the great majority of health workers for Latin America should be trained in Latin America. Particularly is this true for the preparation of public health nurses, health educators, sanitarians, laboratory workers, and various types of auxiliary personnel.

Dr. Gandy believes that such local training facilities should be developed within the framework of existing national public health services, and that these services should subsidize both the schools themselves and the students, where necessary. These students, he suggests, should be selected, at first, primarily from the ranks of those already employed in the official health departments.

An excellent example of what may be accomplished along such lines is offered by the advances made in Chile. Here, the National Health Service, the Rockefeller Foundation, and the Chilean affiliate of the I.I.A.A. have developed a comprehensive training program parallel with its advances in administrative health work. With the counsel and leadership of Dr. Hernan Romero, head of the School of Public Health, and with many instructors who have received special postgraduate training in the United States, 42 medical health officers have been graduated from the course designed for them; while sanitary and food inspectors, laboratory workers, statisticians, and health educators have fulfilled courses leading to certificates in their special fields. All in all, 244 students have received instruction in the school, while 123 public health nurses and 42 nursing aides have completed special training, courses offered in two health centers devoted specifically to that purpose.

In Puerto Rico, there is a more modest, but most promising, development of field training facilities.

We trust that more extensive provisions of this kind may be made in the various large centers of Mexico and Central and South America. It is only through local study and training centers, under national auspices and using the national language, that the health knowledge accumulated in English-speaking countries can be translated—not merely into the language of Latin America, but into the social life and the traditions of Latin America.

## BOOKS AND REPORTS

*All reviews are prepared on invitation. Unsolicited reviews cannot be accepted. All books reviewed in these columns may be purchased through the Book Service.*

The Development of Modern Medicine—By R. H. Shryock. New York: Knopf, 1947. 457 pp. Price \$5.00.

The well known medical historian author has given us a packed volume of condensed medical and cultural record of the past 350 years, abundantly documented and presented in scholarly language by a master bookmaker and printer.

It will not be thought unfriendly or snobbish to suggest that there is little of any new matter not already familiar to well educated physicians or to students and practitioners of contemporary society and its origins.

The "attempt to portray certain major aspects of medical development against the background of intellectual and social history in general" varies in its success among the twenty chapters. Rare judgment and wide familiarity with original sources are evident in a text which condenses the medical story of 1600 to 1800 in the first six chapters. These give fairly routine basic matter selected for the present special purpose. The next four chapters on Science in the Romantic Age, Medicine and the Basic Sciences, Medicine. Mathematics and the Social Sciences, and Emergence of Modern Medicine, are excellent in spirit, outlook, and suggestiveness. Familiar matter of less value is presented in Chapters XI–XV although the thread of thoughtful analysis and social interpretation is well maintained. The last five chapters are perhaps less satisfying because they deal with matters of such recent origin and implications that they savor more of contemporary journalism than of history, and yet all the facts are reliable and important, though less capable of final evaluation than those of earlier half centuries.

It is rare indeed to find an error of name and yet on one page the discoverer of cocaine is spelled once with an *o* and five lines below with an *a* (Koller and Kaller). The author seems to play casually with two spellings for the same word *virulency* and *virulence* without apparently intending any distinction or preference.

Those who study, teach, write, or think in the medical-social field will turn often and eagerly to this almost pocket manual of medical history in the making.

Physicians will welcome so correct and balanced a presentation. The educated laity will be better patients and fairer judges of their physicians if they indulge themselves in this good book.

HAVEN EMERSON

Fleas of Western North America—By Clarence Andressen Hubbard. Ames, Iowa: The Iowa State College Press, 1947. 533 pp. Price \$6.00.

A book which has attracted the attention of *Time Magazine* deserves consideration and review, and glance by the non-professional leaves no doubt that Clarence A. Hubbard has made an important contribution in bringing the systematics of western fleas from the dusty shelves of the specialized library to the workbench of the student of external parasites. The epidemiologist or experimenter with vectors conveying diverse human and animal infections will find here in convenient form a summary of the scattered literature on most of the *Siphonaptera* thus far found in the West. Identification keys have been devised for groups of fleas that previously had none. The data on the biology, morphology, types of hosts, seasonal distribution and abundance will prove very valuable, although the

entomologist may not always be willing to accept the classifications. However, anyone even superficially familiar with the subject will appreciate the tremendous amount of effort which Dr. Hubbard singlehandedly has expended, under a great deal of hardship and personal sacrifice, in making the field collections and laboratory preparations.

The description of the species are clear and well illustrated by a wealth of 'original camera lucida' drawings, which are, however, crowded together so closely that it is often difficult to determine the relationship of a specific name with its respective sketch (see pages 237, 241, 261, 276, 285 and 357). A more detailed account of the internal morphology of fleas and methods of culturing in the laboratory would have been of value. The host index to western fleas and the rapid checking index, which covers over 127 pages, facilitate use of the book. Since the subject is not static, it is not expected that the book will remain complete, but in its present form it is not up-to-date with respect to references. For example, the new subspecies, *Carteretta carteri clavata*, reported by Good in 1942 from Nevada, is not mentioned. Besides making the list of known fleas incomplete, such an omission also weakens the data on geographical distribution. Many more omissions will be found by the specialist.

It is rather unfortunate that the author attempted a presentation of data on the medical importance of fleas. His familiarity with the literature concerning this aspect is, at best, so sketchy that even as a "commentary" it must be considered inadequate. For example, the demonstration of *P. pestis* in *Echidnophaga gallinacea* in 1941 is not mentioned, and the role of fleas in sylvatic plague has been completely overlooked. Furthermore, the impression is given that fleas transmit *Bact. tularensis*, although transmission experiments by

the American entomologists, Prince and Burroughs, have repeatedly failed. Most disconcerting are the recommendations for the medieval use of salt, naphthalene, kerosene, or engine oil in the control of fleas (page 27). Recent experiences with the remarkably effective DDT have apparently made no impression on the author.

K. F. MEYER

**Social Security—Selected List of References on Unemployment, Old Age and Survivors', and Health Insurance, Bibliographical Series No. 78—By Matthew A. Kelly and Hazel C. Benjamin. Princeton: Princeton University Press, 1947. 62 pp. Price, \$.75.**

The Department of Economics and Social Institutions of Princeton University has done a real service in preparing this bibliography of references on the various aspects of social security.

In the discussion of the three types of social security insurance: unemployment, old age, and health, the subject is divided into general problems and philosophy, United States experience, and legislation and experience in foreign countries. This is valuable reference material for those interested in any aspect of the social security problem.

MARTHA LUGINBUHL

**The Co-Operative Process Among National Social Agencies—By Ray Johns, Foreword by Shelby M. Harrison, General Director, Russell Sage Foundation. New York: Associated Press, 1946. 290 pp. Price, \$3.00.**

Whether you, as a public health worker, believe in a little coöperation, a lot of it, or none at all, you owe it to yourself to read with care this treatise on the coöperative process.

It is based on the recent war experiences in coöperation and on current opinion. The author's background, as former Associate Director of USO, leaves him with few illusions as to the problems involved in getting agencies,

their board members, executives, and staffs to work together for a common goal that transcends their individual interests.

Program content is omitted. The book wisely limits itself to the keen analysis of a "process." What is presented about national social agencies applies, therefore, with equal force to national health agencies and to local agencies as well. You will be impressed with the logical, well ordered approach and the objectivity of this study and report. The style is quite unemotional. One cannot escape the feeling that he is reading an account of a difficult exploratory surgical operation—from incision, through probing and dissection, to final closure and prognosis. As a consequence, it is definitely not for the "hammock" reader; but to all persons who are devotedly and unselfishly seeking to improve the health of all people and all communities through our public health agencies, this book is "must" reading.

JOHN W. FERREE

**Public Agency-Council Relationships—A Study published by the Health and Welfare Planning Department. New York: Community Chests and Councils, 1946. 47 pp. Price, \$.75.**

The Department, through its Secretary, Violet M. Sieder, presents the results of a study of the relationships of public welfare organizations to councils of social agencies in 113 communities of various sizes located in different parts of the United States.

The value of publicly supported health and welfare organizations, as well as private ones participating on an absolutely equal basis in privately supported welfare councils, is demonstrated.

The advantages to both the tax supported organizations and to public officials as well as to the privately supported organizations in the community, are evident. The author criticises the

limited efforts made to maintain complete coöperation between public and private agencies in welfare councils. The volume stimulates a desire for closer and more effective coöperation between councils and public officials.

Seven questions which public welfare agencies and councils could well ask themselves are outlined in the appendix.

Sub-headings I, II, III, etc., might well have been more prominent.

HOWARD W. GREEN

**Public Health Nursing Functions In The School Health Program—Prepared by the Minnesota State Department of Health and the State Department of Education, December, 1946.**

Public Health Nursing Functions in the School Health Program is a compilation of material with dates of sections ranging from August, 1943, to December, 1946. Section titles are "Relationships to Health Councils," "Delineating Responsibilities between Nurse and Teacher," "Evaluation of School Health Service Program," and "Appendix."

Two state departments are given credit for preparing the material but participating individuals or divisions are not identified. The affiliation of the secretary and executive officer who signed the foreword is not revealed.

Lack of consecutive page numbering throughout, and the treatment of the same subjects in more than one section without adequate cross-references are disturbing features. An immature nurse probably would be confused by the arrangement.

An interpretation of how the school administrator functions in directing the school health program is lacking.

Good suggestions for promoting school health education are offered in the various sections, particularly in the appendix. Unfortunately, the casual organization of the material fails to give the anticipated clear-cut picture of how

school nursing may become an integral phase of school health program. For contrast, the reader is referred to sections on school nursing in the *Minnesota Manual for Public Health Nurses*.

LULA P. DILWORTH

**Laboratory Control of Water Purification**—By Charles R. Cox. New York: Case-Sheppard-Mann, 1946. 386 pp. Price, \$4.00.

This volume is designed for the assistance of technical personnel in water works laboratories. It is true that untrained laboratory workers are frequently employed, many of whom become proficient in water analysis but who lack fundamental chemical and bacteriological training. The author has attempted to supply this and has done an excellent piece of work. The book should be useful as well to the trained worker who frequently desires to know more of the chemical reactions involved in the various analytical procedures than is given in *Standard Methods for the Examination of Water and Sewage*.

In general the procedures given are those in use in most water laboratories but there are some additions, presumably, from the author's laboratory.

The volume would be more useful if more original references were cited. Probably these were intentionally omitted. *Standard Methods* is mentioned a few times, Whipple's *Microscopy of Drinking Water* once, one *Journal* reference is supplied, and the Public Health Service standards are referred to. A few phrases are confusing—such as "pathological diseases," and the description of the food supply of bacteria—but most of the book is clear and as concise as is consistent with its purpose.

JOHN F. NORTON

**National Health Insurance in Great Britain 1911-1946**—By R. W. Harris. Washington, D. C.: Public Af-

fairs Press, 1946. 224 pp. Price, \$3.25.

The author of this volume has been intimately associated with the British health insurance system, in one capacity or another, since the Health Insurance Bill was presented to Parliament in 1911. At one time an assistant secretary in the Ministry of Health, he is now Chairman of the Medical Service Subcommittee of the London Insurance Committee.

A great deal of important information is contained in this review of British experience. The early history of the Friendly Societies is presented, together with a detailed description of the types of societies and their subsequent development under National Health Insurance. The very high costs of cash sickness benefit administration by approved societies are contrasted with the low costs for administering medical benefits through the insurance committees. Interesting data are presented on patient-doctor relationships, including several case histories illustrating the types of problems dealt with.

Although the volume suffers from poor organization, it represents a valuable contribution to the literature on health insurance and an excellent source for factual data.

MILTON TERRIS

**Tuberculosis As It Comes and Goes**—By Edward W. Hayes, M.D. (2nd ed.). Springfield, Ill: Thomas, 1947. 220 pp. Price \$3.75.

This is a small book of 200 pages written in non-technical language especially for tuberculosis patients and their families. However, it contains valuable factual and inspirational material for tuberculosis workers, including physicians. The author, being a man of wide experience in the treatment of tuberculosis, stresses individualization.

Dr. Hayes answers many of the questions which the average patient and his



relatives wish to ask the doctor. It is noted, however, that he does not mention streptomycin or BCG.

The book can be commended for its conciseness, fairness, and common sense attitude. Apt quotations sprinkled through the pages enhance the readability of the text. There are numerous sketches illustrating various types and stages of the disease before and after treatment. These probably are more intelligible to the layman than reproductions of x-ray films would be.

Especially noteworthy are 2 chapters at the end by Laurence de Rycke, Ph.D., on "Suggestions to Patients," and "Suggestions to Visitors." These chapters alone are worth the price of the book.

JOHN H. KORNS

**Veterinary Bacteriology**—By I. A. Merchant, D.V.M., Ph.D., C.P.H. (3rd ed.) Ames, Iowa: Iowa State College Press, 1946. 633 pp. 137 illus. Price \$7.00.

"Some textbooks of bacteriology include sections which have been omitted purposely from this one. A section on pathogenic protozoa has not been included because such micro-organisms are logically studied in courses of animal parasitology in Colleges of Veterinary Medicine. . . . Laboratory methods of milk and water analysis are completely described in manuals of standard methods published by the American Public Health Association. Inclusion of such methods in this text would be superfluous."

Such, quoted from the preface to this third edition is self-explanatory. Whether such omissions can be used as a basis for any adverse criticism pertaining to the book can be entirely a personal opinion.

The author's decision to use "alexin" fixation instead of "complement" fixation is explained in the chapter "Cytolysis and Alexin Fixation" (Page 196); "The term complement fixation origi-

nated with Ehrlich. He believed that the complement was united to the antigen by the amboceptor, thereby he differed considerably with Bordet who thought the union was due to the action of amboceptor, or sensitizer, upon the antigen. In light of present day knowledge the explanation of Bordet is more acceptable."

Here, again, personal opinion can be the basis of critical comment. Certainly the term "alexin-fixation" does not appear in current literature such as *Venereal Disease Information* (Federal Security Agency, U.S.P.H.S.). The term "alexin" appears *only as a footnote* in a standard reference book pertaining to serology.

The Index of the book contains omissions and some errors among which are:

1. There is no mention of Aschoff or the reticulo-endothelial system, although a brief mention appears in one paragraph on page 209 of the text.
2. There are confusing index mistakes such as "Breed, R. S. 287" which should have been page 288; "Mangold 261" is found at the top of page 260.
3. The index does not mention agglutinin absorption; the text does mention it, briefly, in a paragraph on page 185.

However, the errors are slight; while the omissions can be satisfied by reference to other textbooks.

The type is good, the printing good, the illustrations good; the text sustains interest.

R. V. STONE

**The Principles and Practice of Medicine (Osler)**—By Henry A. Christian, M.D. (16th ed.) New York: Appleton-Century, 1947. 1539 pp. Price, \$10.00.

*Osler's Principles and Practice of Medicine* as revised and edited by Christian under the above title has been a standard text now for 55 years. An excellent chapter by Carr has been added tracing developments in the history of medicine as reflected in these

16 editions since 1892. The present edition has been extensively rewritten so that more than 900 of the 1400 pages have been entirely reset. Public health workers will find the text succinct, inclusive, and up to date. It is inevitable that in such a condensed treatise as this there should be conclusions that will be challenged by public health physicians as, for example, the mass prophylaxis of scarlet fever by sulfa drugs. It could also be said that the description of modified takes from cowpox vaccine is not clearly presented, and there is lacking a desirable link in the descriptions of communicable diseases with the officially adopted and international report on this subject. Nevertheless it seems doubtful whether for public health libraries a better single volume can be found in the English language.

REGINALD M. ATWATER

**Methods of Vitamin Assay—***By The Association of Vitamin Chemists Inc., Chicago. New York: Interscience Publishers, Inc., 1947. 189 pp. Price, \$3.50.*

This text, consisting of nine chapters, has resulted from free discussion and exchange of ideas of the members of the Association, who edited this volume. The methods described are the result of the pooling and interchange of information on analytical techniques, thus representing the combined knowledge and experience of many persons. The background assumed is that of a laboratory technician with limited training in quantitative analysis. The scope of the book is limited to methods that have been successfully applied to a variety of foods. Revisions are planned by the Association from time to time, whenever conditions so indicate.

Chapter 1 gives consideration to the question of sampling for vitamin analyses. Chapters 2 to 7 considers in the greatest detail the best suited method

for the assay of vitamin A, carotene, thiamine, riboflavin, niacin, and ascorbic acid. In Chapter 8, selected reference to other vitamin methods are listed. Finally, Chapter 9 discusses the use of check samples in control of vitamin methods.

With this excellent start, analysts may look forward to future editions of the Association of Vitamin Chemists with interest.

HENRY T. SCOTT

**Milk and Food Sanitation Practice—***By H. S. Adams, B.Sc. New York: The Commonwealth Fund, 1947. 311 pp. Price, \$3.25.*

A well written and practical source of general information on milk and restaurant sanitation for health officials. It appears to have been written for and accomplishes the purposes of giving administrators basic information in these branches of environmental sanitation for which there has been need. The views expressed are fairly representative of modern practice. The eleven appendices contain much additional material in the form of references, information about field equipment and tests, and an outline of a course for the instruction of food handlers.

WALTER D. TIEDEMAN

**Tuberculosis Hospital Planning and Construction —***By J. Bruno Basil, A.L.A., Architect (rev. ed.). New York: National Tuberculosis Association, 1946. 81 pp. Price, \$1.00.*

The subject matter is treated in the manual or handbook style: the statements are readily understood; the reading of it is a pleasure and definitely invites a deeper investigation. All the major and many of the minor problems of tuberculosis hospital planning and construction are broadly presented, and various methods of solution are outlined. This pamphlet reflects wide research and objective analysis of a large amount of data. It is the best of its

type that the reviewer has ever seen and is earnestly recommended not only for those who are planning new build-

ing but also for those who are considering any extensive remodeling of existing facilities. N. STANLEY LINCOLN

## BOOKS RECEIVED

- ADMINISTRATION OF MEDICAL CARE; Problems and Issues. Research Series No. 2. By Odin W. Anderson. Ann Arbor: University of Michigan, 1947. 179 pp.
- THE AMERICAN COUNTY-PATCHWORK OF BOARDS. By Edward W. Weidner. New York: National Municipal League. 1946. 24 pp. Price, \$35.
- THE AMERICAN ILLUSTRATED MEDICAL DICTIONARY. W. A. Newman Dorland, M.D., with the collaboration of E. C. L. Miller, M.D. (21st ed.) Philadelphia: Saunders, 1947. 1660 pp. 880 ill. Price, \$8.50.
- CENTRAL MINING—RAND MINES GROUP. By A. J. Orenstein, M.D. Johannesburg, South Africa. Rand Mines, Ltd., 1946. 20 pp.
- CHEMICALS FOR INDUSTRY. By Rohn & Haas Company. Philadelphia: Rohn & Haas, 1945. 212 pp.
- CHICAGO-COOK COUNTY HEALTH SURVEY. By U. S. Public Health Service, 1947. Chicago: Chicago-Cook County Health Survey. 100 pp.
- DEVELOPMENT DIAGNOSIS. By Arnold Gesell, M.D., and Catherine S. Amatruda, M. D. (2nd ed.) New York: Harper & Brothers, 1947. 496 pp. Price, \$7.50.
- DUNCAN OF LIVERPOOL. By W. M. Frazer, M.D. London: Hamish Hamilton, 1947. 163 pp.
- DUST AND ITS EFFECTS ON THE RESPIRATORY SYSTEM. By George H. Gill, A.M.I., Mech. E. London: H. K. Lewis & Co., Ltd, 1947. 50 pp.
- FOOD POISONING. By Elliot B. Dewberry (2nd ed.) London: Leonard Hill Ltd., 1947. 246 pp. Price \$5.00.
- FOOD REGULATION AND COMPLIANCE VOL. II. By Arthur D. Herrick. New York: Revere, 1947. 655 pp. Price, \$10.00.
- FUNGI VOL. I AND II. By Frederick A. Wolf and Frederick T. Wolf. New York: Wiley, 1947. Vol. I 438 pp. Vol. II 538 pp. Vol. I, Price, \$6.00. Vol. II, \$6.50.
- THE HOOSIER HEALTH OFFICER. A Biography of Dr. J. N. Hurty and the History of the Indiana State Board of Health to 1925. By Thurman B. Rice, M.D. Indianapolis: Indiana State Board of Health. 388 pp. Free.
- HOSPITAL CARE IN THE UNITED STATES. By The Commission on Hospital Care. A. C. Bachmeyer, M.D., Director of Study. New York: Commonwealth, 1947. 631 pp. Price, \$4.50.
- INTRODUCTION TO INDUSTRIAL MEDICINE. By T. Lyle Hazlett, M.D., Editor (2nd. ed.) Chicago: Industrial Medicine, 1947. 260 pp. Price, \$3.00.
- MEDICAL CARE AND COSTS IN RELATION TO FAMILY INCOME. Selected and compiled by Helen Hollingsworth, Margaret C. Klem, and Anna Mae Aney (2nd. ed.). Washington, D. C.: Government Printing Office, 1947. 349 pp. Price, \$1.25.
- NURSING. By Lulu K. Wolf, R.N. New York: Appleton-Century, 1947. 534 pp. Price, \$3.50.
- PHYSICAL FITNESS APPRAISAL AND GUIDANCE. By Thomas Kirk Cureton, Jr., Ph.D., Assisted by Frederick W. Kasch, John Brown, and W. G. Moss, Ph.D. St. Louis, Mo.: Mosby, 1947. 566 pp. Price, \$6.00.
- SCIENCE AND PUBLIC POLICY VOL. I. A Program for the Nation. A Report to the President by John R. Steelman, Chairman. The President's Scientific Research Board. Washington, D. C.: U. S. Government Printing Office, 1947. 71 pp. Price, \$.20.
- SCIENCE IN PROGRESS. Edited by George A. Baitzell (5th. Series) New Haven: Yale University Press, 1947. 353 pp. Price, \$5.00.

## A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

**Even Its Name Is Unsatisfactory—They Say**—Perhaps it is enough for you to know that a British Rheumatic Fever Committee has surveyed the current status of the prevention and management of that disease and reports findings which—so far as I can see—are not greatly at variance with the pronouncements of the experts on this side of the water. The report is full of sound common sense such as this: nothing is so likely to restore a rheumatic child's morale, as a return to reasonable exertion. A suggestion is made that the disease might better be called "heart fever."

ANON. Rheumatic Fever. M. Officer. 77, 22:217 (May 31), 1947.

**Citizens of Tomorrow**—Although deaths among 5-14 year olds have dropped from 3.9 (per 1,000) in 1900 to 0.9 today, there is still plenty of room for improvement. Accidents (preventable) are the chief cause of death, with rheumatic fever, communicable diseases, and appendicitis poor seconds. Teeth conditions are shockingly bad.

ANON. Health Problems of School-Age Children. Stat. Bull. (Met. Life Ins.) 28, 5:3 (May), 1947.

**Justified by Its Fruits**—Boosted here is the "comics" book as a health educational device. From a happy experience with "Little Willie" the writer concludes that this dubious medium really produces results in action by those who won't read but will look at "the pitchers."

BILLINGS, T. E. Venereal Disease Education. J. Ven. Dis. Inform. 28, 8:162 (Aug.), 1947.

**Shaping Nutrition Policies**—Four

useful papers on nutrition in public health administration begin with a world view by Boudreau, then follow a survey of new activities by Wilkins, a description of a State Department program by Getting, and further suggestions about administration by Goodhart. These names should convince you that the series is your meat.

BOUDREAU, F. G., *et al.* Nutrition in War and Peace (and three related papers). Milbank Quart. 25, 3:231 (July), 1947.

**"That We Do the Job Right"**—We have been trying to sneak sex education into people by disguising it with fancy names, says this writer. It's like flavoring cod liver oil with wintergreen: it may do the patient as much good but it doesn't taste any better.

GOFFIN, L. C. What Is Sex Education? J. School Health. 17, 6:151 (June), 1947.

**Belsen** — Coldly matter-of-fact, this account of the Army's delousing of the still-breathing remainder of the inmates—and the resulting prompt cessation of a typhus epidemic—manages to become an eloquent reminder that this hideous word will long remain the one perfect symbol of human bestiality.

DAVIS, W. A. Typhus at Belsen. Am. J. Hyg. 46, 1:66 (July), 1947.

**Not Original But Good**—Booster-dosing is still new enough to warrant calling your attention to an occasional review article, I assume. This is a useful one for you. Combined antigens, asserts the writer, not only do not interfere with each other but frequently they enhance the total effect.

GREENBERG, M. Use of the Booster Dose for Reimmunization. Pub. Health Nurs. 39, 8:382 (Aug.), 1947.

**Out of U. S. A. by Denmark—** Even though you are well versed in the essential elements of tuberculosis control programs you will be repaid for reading this eloquent and convincing plea for a world-wide attack on the disease.

HILLEBOE, H. E., and HOLM, J. International Control of Tuberculosis. Pub. Health Rep. 62. 31:1114 (Aug. 1), 1947.

**Problem Drinkers Are Sick People—** Man is the problem, not the bottle, the researchers in the field of alcoholism now assert. You'll be pleased with this broadminded account of plans for treatment, research, and legislation to meet our national "Lost Weekend."

HIRSH, J. Alcoholism: What Is It? Survey Midmonthly. 33. 6:163 (June), 1947.

**Which Rodenticide Do You Use?**—Though this paper is about the use of "1080" against rats on ships, it ends with the reminder that the poison is highly toxic for larger animals (including the alleged *sapiens* variety). The poison is a white powder which could be mistaken for flour or baking powder and probably will be. What to do if the mistake is made is set forth, but the moral seems to be: you'd better use ANTU.

HUGHES, J. H. Studies in Deratization of Surface Vessels by Means of 1080 (Sodium Fluoroacetate). Pub. Health Rep. 62, 26:933 (June 27), 1947.

**Psychiatry Now Has Help To Offer—** That there is any relationship between public health practice and mental hygiene is a relatively new concept and one not yet universally accepted. This is the opening premise of this paper. This introduction ought to be enough to enable you to decide whether or not you should know what the professor said about the subject to the International Health Organization.

LEMKAU, P. V. Mental Hygiene in Public

Health. Pub. Health Rep. 62, 32:1151 (Aug. 8), 1947.

**More About Infant Pincushions—** A prophylactic timetable is proposed calling for jabs at 6, 7, 8, and 10 months, 1 year, 15 and 18 months, then at 2, 4, and 6 years. Thereafter tetanus toxoid every 2 years. Long before the "thereafter" is reached, friendship of the child and the doctor will be firmly established—on a strictly fighting basis.

MILLER, J. J. Immunization Procedures in Pediatrics. J.A.M.A. 134, 13:1064 (July 26), 1947.

**On the Altar of Modern Efficiency—** During the last five years, 84 California hospitals have had outbreaks of diarrhea of the new-born, some hospitals repeatedly. And this is not a uniquely dark record! The epidemiology of the disease, its clinical aspects, and correctional procedures are set forth. If there is a single, top-priority public health emergency, this would seem to me to be it.

MOORE, J. A., *et al.* Diarrhea of the New-born. California's Health. 4, 24:189 (June 30), 1947.

**Work and School—** Seems incredible, doesn't it, that the (British) Health and Morals of Apprentices Act of 1802 could have permitted the employment of children for 12 hours a day. And another encouraged the factory employment of those who had reached the advanced age of nine. School and working conditions are better today for English children though there is still room for improvement—if these two papers are to be credited. They call forcibly to mind some of the related notes and beams in our own sociological eyes.

NEWT, A. A. E. and LLOYD DAVIES, T. A. The Change from School to Industry. Pub. Health. 60, 9:177 (June), 1947.

**Based in Reason and on Present Knowledge—** On the assumption

that poliomyelitis virus is present more frequently and for a longer time in the intestinal tracts than in the throats of both cases and carriers, nine control measures are advocated—not with the idea that they will stop an epidemic but that because of them some persons may escape infection who might otherwise become paralyzed. Don't miss this!

SABIN, A. B. The Epidemiology of Poliomyelitis. J.A.M.A. 134, 9:749 (June 28), 1947.

**World Food Needs**—When you contemplate the rapidly increasing numbers of newly opened hungry mouths in India and China that will be turned toward us to be fed after we've taken care of starving Europe, do you sometimes wonder how it can be done? Well, here is one of those world-wide surveys to tell us that all the hungry could be fed if . . . Did you know that only 7-10 per cent of the land area is cultivated? Did you know—you'd better read the questions as well as the answers yourself.

SALTER, R. M. World Soil and Fertilizer Resources in Relation to Food Needs. Science 105, 2734, 533 (May 23), 1947.

**How To Tell Who's Undernourished**—First of a series to inform health workers about the methods and the findings of nutrition demonstration units, this one gets off to an interesting start. You had better get in at the beginning.

SANDSTEAD, H. R. and ANDERSON, R. K. Nutrition Studies. Pub. Health Rep. 62, 30, 1073 (July 25), 1947.

**This Will Slay You!**—Average caries indices of a large sampling of post-war Italians in four cities were two to seven times lower than in the good-old U. S. A. The people examined were for the most part malnourished and the level of their oral hygiene was what you'd expect. It wasn't fluorine,

either—or low carbohydrate intake. Suggested as two possible factors are shortage of refined sugar and vitamin B deficiencies.

SCHOOR, I. and MASSLER, M. Dental Caries Experience in Post-war Italy. J. Am. Dent. A. 35, 1:1 (July 1), 1947.

**Promiscuous Mis-Use Deplored**—This is medicine pure and simple, but the findings should be part of your public health "info" kit. Penicillin aerosol therapy is of definite value in the management of appropriate (but only appropriate) respiratory diseases. It should not be used against the common cold.

SEGAL, M. S., *et al.* Penicillin Inhalation Therapy in Respiratory Infections. J.A.M.A. 134, 9:762 (June 28), 1947.

**Shoemaker's Children**—Perhaps the most disturbing part of this grim but gripping discussion (which I advise you not to miss) is the list of famous stomach surgeons—and a roentgenologist who contributed a useful diagnostic sign—all of whom developed gastric cancers which had become inoperable before they could be recognized. Forty thousand out of the 150,000 annual cancer deaths are gastric. Indifference and inertia are more to be feared than cancer phobia, concludes the writer, as he urges us to get back of the preventive, educational program.

WAGENSTEEN, O. H. The Problem of Gastric Cancer. J.A.M.A. 134, 14:1161 (Aug. 2), 1947.

**Maternal Rubella**—This quotation, from *King Lear* may come in handy some day, so I pass it along to you: "That foul fiend, Flibbertigibbet . . . gives the web and pin (cataract), squints the eye, and makes the harelip." The modern-day name for Flibbertigibbet is rubella, when it attacks in the first trimester of pregnancy.

WESSELHOEFT, C. Rubella (German Measles). New England. J. Med. 236, 25:943 (June 19), 1947.

# ASSOCIATION NEWS

## APPLICANTS FOR MEMBERSHIP

*The following individuals have applied for membership in the Association. They have requested affiliation with the Sections indicated.*

### *Health Officers Section*

- Colin W. Brockington, M.D., D.P.H., East Kootenay Health Unit, Cranbrook, B. C., Canada, Director
- Emilio Budnik, M.D., Dr.P.H., Casilla 9221, Santiago, Chile, S. A., Medical Officer, National Public Health Service
- Dr. J. Leon Chenel, Saint Anselme, Co. Dorchester, P. Q., Canada, Medical Officer, Health Unit
- Leoncio T. Davis, M.D., Medical Director, Vieques, Humacao, P. R.
- Major John F. Harris, M.C., 294th Medical Prophylactic Platoon, APO 900, San Francisco, Calif., Venereal Disease Control Officer, Base Section, Philippines—Ryukyus Command
- Huai-hsin Huang, M.D., 185 Dubail, Apt. 12, Shanghai, China, Director, Sinza Health Demonstration Center, Health League of China
- Joseph D. Martin, M.D., 101 North Blvd., Baton Rouge, La., Director, City-Parish Health Unit

### *Laboratory Section*

- Miguel Cordeiro de Azevedo, M.D., M.P.H., Av. Padre Eutiquio 683, Belem, Para, Brazil, S. A., Chief, Serology Section, Institute Evandro Chagas
- E. Edith H. Hersey, North Ridge Road, Peekskill, N. Y., Microbiologist, Connecticut State Bureau of Laboratories
- G. Briggs Phillips, S-Division, Camp Detrick, Frederick, Md., Biological Laboratory Technician, U. S. War Dept.
- Andrew C. Rice, Winfield, Pa., Student, Bucknell University
- Reverend Nicholas H. Serron, Providence College, Providence, R. I., Professor of Bacteriology
- H. Carlton Sweeley, 1201 Hepburn St., Williamsport, Pa., Clarkson Chemical Co., Inc.
- Elaine L. Updyke, Sc.D., 720 Fuller N. E., Grand Rapids 3, Mich., Pertussis Research Bacteriologist, American Public Health

Assn., Michigan Dept. of Health Laboratories

### *Vital Statistics Section*

- Richard Brewer, 1 Hunter St. West, Atlanta, Ga., Director, Division of Vital Statistics, State Dept. of Public Health
- Merriss Cornell, M.A., 281 S. State St., Westerville, Ohio, Professor of Social Statistics, School of Social Administration, Ohio State Univ.
- Nelson Luiz de Araujo Moraes, M.D., M.P.H., Rua Bambina 56, Rio de Janeiro, Brazil, S. A., Head, Biostatistics Section, Servico Especial de Saude Publica
- Hubert E. Navarro, Belisario Salinas St. 291, La Paz, Bolivia, S. A., Chief, Departamento de Bioestadistica y Personal, Direccion General de Sanidad
- Johannes Nielsen, United Nations Statistical Office, Lake Success, N. Y., Consultant
- Manuel A. Perez, 205 Recinto Oeste, San Juan, P. R., Director of Personnel, Government of Puerto Rico
- Ralph W. Roberts, M.S., State Health Dept., Montgomery 4, Ala., State Registrar and Director, Bureau of Vital Statistics
- Achilles Scorzelli-Junior, M.D., M.P.H., Rua Uberaba 31, Rio de Janeiro, Brazil, S. A., Head, Statistical and Reporting Section, Servico Especial de Saude Publica
- Charles C. Wilson, 3 Evans Drive, Savannah, Ga., Training Officer-Records Analyst, U. S. Public Health Service
- ### *Engineering Section*
- James B. Arbuthnot, M.S., 1637 Illinois, Lawrence, Kans., Sanitary Engineer, State Board of Health
- W. Joseph Daniel, Jr., 5416 S. E. Flavel Drive, Portland 6, Ore., Owner-Manager, Restaurant Specialty Co.
- John W. Flatt, Thomas County Health Dept., Thomasville, Ga., Sanitary Engineer
- Tom S. Gable, Allegan County Health Dept., Allegan, Mich., Public Health Engineer
- N. Krishna Murthy, M.S., 927 First Ave.,

Columbus, Ga., Sanitary Engineer, Government of India  
 M. Lee Seabolt, 221 North LaSalle St., Chicago, Ill., Supervisor, Consumer Education Program, Galvanized Ware Manufacturers Council  
 Lt. Fred E. Stewart, U. S. Naval Air Station, Dispensary, San Diego, Calif., Sanitation, Venereal Disease Control and Rodent Control Officer

#### *Industrial Hygiene Section*

Carlton E. Brown, Sc.D., Camp Detrick, Frederick, Md., Scientist, War Dept. Chemical Corps  
 Joseph A. Hubata, M.D., Armour and Co., Medical Dept., Union Stock Yards, Chicago 9, Ill., Medical Director  
 Donald G. Hurd, Box 56, Tolland, Conn., Supervisor, Medical Records and Statistics, Pratt and Whitney Aircraft  
 Claude L. G. Proche, M.D., 15 rue Baillet-Latour, Versailles, France, District Medical Director, French National Railway Co.

#### *Food and Nutrition Section*

Leila Kaplan, M.A., 316 West 75th St., New York 23, N. Y., Nutritionist, City Dept. of Health  
 Eola P. Rooks, 1101 N. 3rd St., Monroe, La., Public Health Nutritionist, State Health Dept.

#### *Maternal and Child Health Section*

Dr. E. Ouellette, Saint-Gervais, Bellechasse, P. Q., Canada, Medical Officer, Health Unit

#### *Public Health Education Section*

Raphael M. Adelman, M.D., D.D.S., 3215 W. North Ave., Chicago, Ill., Dentist  
 Charles Cooper, 337 N. 4th Ave., Phoenix, Ariz., Sanitarian, Maricopa County Health Dept.  
 Henry L. Crittenden, 208 Crescent Ave., San Antonio, Tex., Recently Chief, Bureau of Administrative Services, San Antonio Health Dept.  
 Mary A. Donnelly, R.N., 33 South High St., New Britain, Conn., Nursing Field Representative, American Red Cross  
 Edward K. Grissom, M.S., Two Hundred and Seven, Biology Bldg., Univ. of Tennessee, Knoxville, Tenn., Instructor in Health Education  
 Ruth M. Hartwick, R.N., 215 Shepard Ave., Hamden, Conn., Field Exec., New Haven County Chapter, National Foundation for Infantile Paralysis  
 Florence L. Marcus, M.D., 5230 Center Ave., Pittsburgh, Pa., Student, Harvard School of Public Health

Charles Matlage, 312 Cherry St., Douglaston, L. I., N. Y., Asst. Editor, Health Officers News Digest

Robert C. Milligan, 323 Guaranty Bldg., Galveston, Tex., Secy., Anti-Tuberculosis Assn.  
 Georges-Henri Nolin, M.D., Matane, P. Q., Canada, Medical Officer, Matane Health Unit

David H. Ross, M.D., M.P.H., 1 East 100th St., New York 29, N. Y., Asst. Director, Mount Sinai Hospital

Joseph A. Staton, M.P.H., 215 Commercial Bldg., Box 468, Raleigh, N. C., Field Secy., North Carolina Tuberculosis Assn.

Mary H. Trustdorf, M.S., 265 Henry St., New York 2, N. Y., Health Education Asst., New York Tuberculosis and Health Assn.

#### *Public Health Nursing Section*

Lorna J. Dillon, R.N., Box 319, Juneau, Alaska, Public Health Nurse, Juneau Public Health Center, Territorial Dept. of Health  
 Dorothy A. Dressler, B.S., in N., Territorial Dept. of Health, Seldovia, Alaska, Public Health Nurse

Celia M. Ferguson, 545½ S. Lincoln, Springfield, Ill., Orthopedic Nursing Consultant, Division of Services for Crippled Children, Univ. of Illinois

Margaret G. Harrison, 78 Ellis St., N. E., Atlanta, Ga., Asst. Supervisor, Metropolitan Nursing Service

Christine D. Kirsche, 146 Nassau St., Princeton, N. J., Asst. Supervisor, Division of Cancer Control, State Dept. of Health

Lois G. Morgan, R.N., Box 173, Nome, Alaska, Staff Nurse, Territorial Dept. of Health

M. LaVon Taylor, 199 Courtland St., Bridgeport, Conn., Supervisor, Visiting Nurse Assn. of Bridgeport

Ruth V. Thomason, Court House, Urbana, Ill., Nursing Consultant, Division of Services for Crippled Children, Univ. of Illinois

Mary B. Weld, R.N., 201 West Gay, Warrensburg, Mo., Public Health Nurse, Johnson County Health Dept.

#### *Epidemiology Section*

David H. Davis, M.D., M.P.H., 2629 North Potomac, Arlington, Va., Head of Epidemiology Unit No. 100, U. S. Naval Medical Center, Bethesda, Md.

William R. Donovan, M.D., M.P.H., 198 North St., Geneva, N. Y., Asst. District Health Officer, State Dept. of Health

Joseph Stokes, Jr., M.D., 1740 Bainbridge St., Philadelphia, Pa., Professor of Pediatrics, Univ. of Pennsylvania

Sarah F. Welch, 605 Volunteer Bldg., Atlanta



3, Ga., Statistics, Communicable Disease Center, U. S. Public Health Service

*School Health Section*

Hulda Kloenne, 258 West 22nd St., New York 11, N. Y., Educational Director, the Public Health Committee of the Paper Cup and Container Institute

Melba B. O'Quinn, M.A., 223 Toulane St., Natchitoches, La., Chairman, Women's Division, Health and Physical Education Dept., Northwestern State College

Edward Schwabe, M.D., Brocton, N. Y., General Practice

*Dental Health Section*

Hermann Becks, M.D., D.D.S., Medical Center, Univ. of California, San Francisco 22, Calif., Special Consultant, Dental Studies Section, U. S. Public Health Service

March K. Fong, 590 Lake Park Ave., Oakland 10, Calif., Instructor in Dental Hygiene, Univ. of California

*Unaffiliated*

Astrid C. Erickson, 1015 13th Ave., North, Fargo, N. D., Agent in Health Planning, North Dakota Extension Service

Samuel H. Klein, M.D., 16 East 65th St., New York, N. Y., Assoc. Surgeon, Mount Sinai Hospital

William M. S. Lauder, M.D., 1715 E. Washington St., Charleston, W. Va., Asst. Director, Bureau of Tuberculosis Control, State Dept. of Health

Mae S. Straton, 1424 Kanawha Blvd., 8 Regal Apt., Charleston, W. Va., Administrative Asst., Division of Medical Services, State Dept. of Public Assistance

DECEASED MEMBERS

Prof. Irving Fisher, New Haven, Conn., Elected Member 1903, Elected Fellow 1922, Life Member, Forty Year Member, Vital Statistics Section

Francis E. Harrington, M.D., Minneapolis, Minn., Elected Member 1916, Health Officers Section

Vernon D. Irwin, D.D.S., Minneapolis, Minn., Elected Member 1937, Dental Health Section

William M. McKay, M.D., Salt Lake City, Utah, Elected Member 1937, Epidemiology Section

Guy H. Faget, M.D., Carville, La., Elected Member 1947, Health Officers Section

Eduardo Joubanc, Tampico, Tamaulipas, Mexico, Elected Member 1947, Engineering Section

Edward M. L'Engle, M.D., Jacksonville, Fla., Elected Member 1937, Vital Statistics Section

## EMPLOYMENT SERVICE

The following pages present information for those seeking qualified public health personnel and for those seeking positions in public health.

This is a service of the Association conducted without expense to the employer or employee.

Address all correspondence to the Employment Service, A.P.H.A., 1790 Broadway, New York 19, N. Y., unless otherwise specified.

### POSITIONS AVAILABLE

(Supplemental to list in September Journal)

**Trained Laboratory Aids and Bacteriologists** needed in Wisconsin Civil Service. Three weeks' vacation with pay, sick leave, retirement benefits, permanency. Laboratory aids' salaries beginning at \$155 and \$180 a month. Bacteriologists at \$190 a month. For further information write to the Bureau of Personnel, State Capitol, Madison 2, Wis.

1. **District Health Officers**, salary range from \$5,160-\$6,060 (including \$30 per month cost of living bonus). Requirements: physician licensed to practise medicine in Wisconsin or eligible for license; under fifty years. The physicians selected under state Civil Service requirements would be eligible for an academic year of public health training at a generous stipend.

2. **Director of the Tuberculosis Control Division** (Medical Specialist in Public Health II). Salary \$6,060-\$7,260 (including \$30 per month cost of living bonus). Requirements: physician, licensed to practise medicine in Wisconsin or eligible for license; degree from a recognized school of public health; three years' experience in the administration of public health activities. Special training and experience in the field of tuberculosis control desirable and may be substituted for the public health training and experience requirements. Write Wisconsin State Board of Health, Madison, Wis., for application blanks.

**Physician for position in Michigan.** Prefer pediatrician with training in public health, but will consider physician with public health training and experience in the field of maternal and child health. This is a special project and will be both interesting and stimulating. Salary \$6,000 plus car allowance of 6¢ a mile. For further details contact Robert F. Hall, M.D., Director, Isabella County Health Department, Mt. Pleasant, Mich.

**Experienced Laboratory Technician** as chief technician of hospital laboratory, Northeast. College degree and several years' experience in bacteriology or chemistry. Military experience as labo-

ratory officer highly regarded. Minimum starting salary \$3,600. Write Box L-537, Employment Service, A.P.H.A.

1. **Senior Serologist.** Requirements: Bachelor's degree and one year graduate work in acceptable college or university, and two years' experience in same type of work.

2. **Senior Water and Milk Bacteriologist.** Requirements: Bachelor's degree with one year's graduate work in an acceptable college or university, and two years' experience in same type of work.

3. **Junior Biologist, two.** Requirements: Graduation from an acceptable college or university with major in biological subjects, preferably in bacteriology and serology. Address inquiries to C. F. Adams, M.D., State Division of Health, Jefferson City, Mo.

**Health Commissioner for County** of 40,000, Midwest. Possibility of including three cities located in the county in the County Unit. Salary open. Write Box K-2, Employment Service, A.P.H.A.

**Physician as Director City-County Health Department, Eau Claire, Wis.,** population 56,000; staff of 14; ideal offices and laboratory. Salary for man with degree in public health \$6,180 plus 6¢ per mile travel. Write Charles K. Kincaid, M.D., City-County Health Department, Safety Bldg., Eau Claire, Wis.

1. **District Health Officer.** Starting salary \$4,800 plus \$1,500 travel for personally owned car. Applicants over 45 years of age must have had previous experience in a full-time public health position.

2. **Venereal Disease Clinician.** Salary \$4,500.

3. **Senior Bacteriologist-Serologist.** Salary \$3,300.

4. **Senior Assistant Bacteriologist-Serologist.** Salary \$2,400.

5. **Junior Bacteriologist-Serologist.** Salary \$2,100. Positions are with the New Mexico Department of Public Health. For position requirements and application forms write: Merit System

Supervisor, P. O. Box 939, Santa Fe, N. M.

Bacteriologist in state branch laboratory, State of Colorado. Required: college degree with specialization in bacteriology. No residence requirement. Beginning salary \$2,400, advancement possible. Write Dr. R. L. Cleere, M.D., Executive Director, State Department of Public Health, 414 State Office Building, Denver, Colo.

Public Health Staff Nurses for generalized program under supervision. Salary range \$225-\$275. Liberal car allowance. Write: Public Health Nursing Section, Oregon State Board of Health, 1022 Southwest Eleventh Avenue, Portland 5, Ore.

Public Health Nurses with training and experience for county health departments in Virginia. Salary range \$2,563 to \$3,360 plus travel. Liberal vacation provisions. Write State Health Commissioner, State Office Building, Richmond 19, Va.

Nurses for Tuberculosis Sanatoria (white and Negro) in Virginia. Salary for supervisor \$2,428, for general duty nurse \$2,160. Write State Health Commissioner, State Office Building, Richmond 19, Va.

Director and Staff Nurses for generalized program in City and County of 105,000 population. Educational and cultural center including three colleges. Salaries based upon qualifications for staff nurses ranging from \$2,900-\$3,440, and for Director \$3,500-\$3,700 per year plus travel. Apply: Health Department, Kalamazoo, Mich.

Public Health Nurses for generalized nursing program. Vacancies exist for graduate nurses to be trained as Public Health Nurses. Salaries range from \$2,644.80 to \$3,397.20 (P-1 grade). Public Health Nurses' salaries range from \$3,397.20 to 4,149.60 (P-2 grade). Write to Dr. George C. Ruhland, Health Officer, or Mrs. J. P. Prescott, Director, Bureau of Public Health Nursing, District of Columbia Department of Health, Washington, D. C.

Public Health Nurses, Baltimore County Health Department. Population 250,000; urban, suburban, and industrialized areas; county seat 8 miles from Baltimore. Generalized service; director, 4 supervisors, 25 field nurses. Immediate large expansion planned. Beginning salary \$2,300 (for trainee) to \$2,700, depending on experience and education. Opportunity for increases up to \$3,300.

Retirement plan; one month's vacation; 5 day, 35½ hour week; sick leave. For use of personal car, allowance of 7 cents per mile. Write to Dr. William H. F. Warthen, Health Officer, Baltimore County Health Department, Towson 4, Md.

Staff Public Health Nurse for Department of Public Health, Oak Ridge, Tenn. Generalized Nursing Service for city of 35,000 population. Industry in connection with research and development of nuclear power. Minimum salary \$2,709 per annum. Forty hour work week. Car furnished for all official work. Apply: Charles H. Benning, M.D., M.P.H., Director of Public Health, P. O. Box 486, Oak Ridge, Tenn.

Public Health Nurses with Certificate. Salary \$230 per month; 40 hour week. Generalized program; opportunity for advancement. Write J. B. Eason, M.D., Director City Health Department, Spokane, Wash.

Two Public Health Nurses to teach in midwestern university. One responsible for certificate level program. One to develop program of study for graduate nurses preparing to integrate social and health aspects in basic schools of nursing. Must have Master's degree and a good combination of public health nursing experiences including supervision. Preference given to those with teaching experience. Beginning salary \$4,000 for ten month contract. Write Box N-398, Employment Service, A.P.H.A.

Public Health Nurses for generalized program. Atomic energy project in State of Washington. Salary range \$62.80 to \$69.70 for forty hour work week. Automobiles furnished for work. Write Business Office, Kadlec Hospital, Richland, Wash.

Public Health Nurses are needed in Georgia: The State and County Departments of Public Health in Georgia invite qualified public health nurses to apply for permanent positions in Georgia. Staff nurses must have a minimum of six months' postgraduate public health nursing education in addition to acceptable basic training. Salaries range from \$2,100 to \$2,340 in addition to a liberal travel allowance. Supervisory nurses must have at least two years' experience in public health nursing as well as one academic year of postgraduate training in public health nursing. Salaries range from \$2,400 to \$3,000 in addition to travel allowances. Scholarships are available for graduate nurses who are interested in receiving public health nursing training. Write Personnel Administrator, State

Health Department, State Office Building, Atlanta, Ga., for application forms and full details.

District Health Officers for the State of Washington. Requirements: Graduation from an approved medical school, one year internship and 3 years in professional medical work; or 1 year in professional medical work and 1 year's study in school of public health. Salary \$6,000 to \$7,140. Exceptional candidates can start above the minimum level. Write State Personnel Board, Washington State Department of Health, Smith Tower, Seattle 4, Wash.

Graduate in Bacteriology with some background in chemistry and experience in field of sewage and water research or treatment. To take charge of section in newly organized research project, Eastern United States. Salary \$3,200-\$4,200 depending upon qualifications. Write Box L-535, Employment Service, A.P.H.A.

Director of Nutrition for Red Cross Chapter in a midwestern metropolitan center. Candidate must have sound nutrition background and experience in community activity. Excellent opportunity to develop a broad program on a long-term basis with cooperation from health, education, social welfare, and business leaders. Salary open. Write, Box E-3, Employment Service, A.P.H.A.

Positions are open in Georgia for county and district commissioners of health. Salaries for experienced public health physicians range from \$6,600 to \$7,500. Salaries for physicians with public health training who are entering the field range from \$5,640 to \$6,840. Liberal travel allowances supplement these salaries. Tenure of office is assured by a merit system. License to practise medicine in Georgia is required. Ample opportunities for training are offered with liberal stipend while in training. Write T. B. Abercrombie, M.D., Director, State Health Department, State Office Building, Atlanta 3, Ga., for application forms and full details.

1. Sanitary Engineer with training and experience. Maximum salary \$4,200.
2. Sanitarian with experience in food and milk control, salary up to \$3,000, for County Health Department, Southeast. County seat in large urban center. Write Box E-516, Employment Service, A.P.H.A.

Physician with experience or training in public health for Director of County health unit; headquarters in Bisbee, Ariz.; population 39,000; salary dependent upon training and experience; liberal flat rate

for travel allowance. Apply Cochise County Health Service, Box 1193, Bisbee, Ariz.

School Physician for school district with a school population of more than 10,000. To take complete charge of the elementary program. Salary approximately \$6,000. West Coast. Write Box D-3, Employment Service, A.P.H.A.

Sanitarian with experience in food handling and restaurant sanitation. Age 25 to 40 preferred. Health department experience necessary. Starting salary \$3,000 plus ample travel allowance. Must be well educated and diplomatic. State education, experience, and age in reply. Must have own car. State of Wyoming. Write State Health Officer, Cheyenne, Wyo.

Physician for director of the health department medical services and to be assistant to the director of public health in one of the larger cities in Michigan. The work comprises supervision of child health conferences and school health programs, and communicable disease control including conduct of venereal disease clinics. Graduate from approved medical school with Michigan license. At least one year's public health training and experience preferred. Full-time position under merit system, opportunity for advancement. Vacation and sick leave and travel allowances. Salary dependent on qualifications. Give full particulars in first letter and earliest date available. Write Box J-2, Employment Service, A.P.H.A.

Registered Graduate Nurses: as ward supervisors. Beginning salary \$180. Live in or out. Forty-eight-hour week. Uniforms and laundering of them if desired. Write immediately: Tennessee Department of Public Health, Division Tuberculosis Control, Nashville, Tenn.

Supervising Public Health Nurse and Public Health Staff Nurse in Alger-Schoolcraft Health Department in the Upper Peninsula of Michigan. Supervising nurse salary \$2,700 plus travel expenses. Staff nurse salary \$2,400 plus travel. Liberal vacation and sick leave allowed. Write to Dr. W. J. Broad, Director, Alger-Schoolcraft Health Department, Manistique, Mich.

Several qualified Public Health Officers in Texas. Salary range \$5,500 to \$7,200 per year plus travel allowance. Apply to George W. Cox, M.D., State Health Officer, Austin, Tex.

Applications for position of Director of the Weld County Health Department,

Greeley, Colo. Require graduation from Class A Medical School with training or experience in public health. Present salary is \$500 per month plus travel expense. Please send qualifications in first letter and apply to R. L. Cleere, M.D., Executive Director, State Board of Health, State Office Building, Denver 2, Colo.

Well trained Bacteriologist capable of supervising bacteriologists working in state mental institution laboratories, \$305-\$365 monthly; also bacteriologists to be trained in state health department laboratory for positions in state mental institution laboratories, \$190-\$245 monthly. Write Box L-539, Employment Service, A.P.H.A.

Bacteriologist, male, minimum three years' experience in Public Health Laboratory; college graduate with major in bacteriology, preferably supplemented by courses in science leading to a Master's degree; \$270 to begin, advancing to \$340; Civil Service status; Retirement. Apply to: A. T. Johnson, Personnel Officer, Oregon State Board of Health, 1022 S.W. 11th Ave., Portland 5, Ore.

Laboratory Technician, male or female; college graduate with major in bacteriology, plus minimum of two years' ex-

perience in Laboratory; \$200 to begin, advancing to \$260; Permanent, Civil Service status; Retirement. Apply to: A. T. Johnson, Personnel Officer, Oregon State Board of Health, 1022 S.W. 11th Ave., Portland 5, Ore.

Supervisory Nurse, Nursing Education Director, and Staff Nurse positions available: City-County Health Department, generalized nursing program. Nursing Education Director, \$2,940-\$3,240, degree in public health nursing required. Supervisor, \$2,520-\$2,940, degree preferred. Sr. Staff Nurse, \$2,220-\$2,400, a certificate or its equivalent. Maximum salary reached in three year period. Forty-hour week, retirement plan, mileage. Write Dr. Geo. A. Denison, Box 2591, Birmingham, Ala.

Supervising nurse for City-County Department of Health. Thriving, progressive industrial and agricultural community of 74,000. Staff of nine nurses with promise of more in 1948. New and interesting developments, such as cancer diagnostic clinic, expanding school health program, additional child welfare clinics. Special Venereal Disease and Tuberculosis Clinics. Salary \$3,192 plus \$600 travel. Address Fred O. Tonney, M.D., Commissioner of Health, Municipal Building, Mansfield, Ohio.

### POSITIONS WANTED

Position in School Health Education or Community Organization in public health. Seventeen years' experience in teaching and community organization in public health. M.S.P.H. from a leading university. East or Middle West preferred. Write Box H-538, Employment Service, A.P.H.A.

Sanitary Engineer with five years' experience in public health engineering, including waste disposal, insect control, and industrial sanitation, desires position in the East. M.S. degree in Sanitary Engineering. Veteran, age 29. Reply Box E-510, Employment Service, A.P.H.A.

Public Health and Sanitary Engineer. Master's degree in sanitary engineering. Experience: District Engineer with State Health Department 4 years; Sanitary Corps U. S. Army 4 years; consulting Sanitary Engineer 2 years. Some teaching experience. Seeks position in official agency, private industry or teaching institution. Write Box E-518, Employment Service, A.P.H.A.

Recent Graduate Veterinarian (KSC '47) desires employment. Has had ex-

perience working for the Health Department of the District of Columbia. Age 32, married, no children. Write Box V-304, Employment Service, A.P.H.A.

Veterinarian interested in any phase of Public Health Work, governmental or voluntary. Willing to undergo period of training. Training includes D.V.M. and B.S. degrees, with electives in chemistry, bacteriology, sanitation, animal micrology. Experience: University histology, laboratory, city health department diagnostic laboratory, senior consultant veterinarian, UNRRA. Write Box V-306, Employment Service, A.P.H.A.

Licensed Veterinarian: Public health and disease control experience in U. S. and abroad desires position in public health or industry. Write Box V-308, Employment Service, A.P.H.A.

Hawaii Board of Health Wants: One Public Health Statistician to direct the Bureau of health (vital statistics). (Salary: \$407.08 to \$481.67 plus \$25.00 monthly bonus.) Qualifications: Five years of responsible statistical experience, of which three years shall have been of a research

and supervisory character in the field of public health, and graduation from a university of recognized standing with courses in advanced statistics, supplemented by one year of graduate work in public health with specialization in public health statistics. Write air mail to: President: Board of Health, P. O. Box 3378, Honolulu 1, Hawaii.

Qualified personnel to serve with Eighth

Army in Japan and Korea. Civilian Status. One to 2 years minimum tour of duty. Periodic vacancies for: (1) Physicians as public health officers and welfare officers. (2) Public health nurses. (3) Sanitary Engineers. (4) Laboratory Workers. For information write to: Personnel and Training Branch, Civil Affairs Division, War Department Special Staff, Washington 25, D. C.

### Advertisement

## Opportunities Available

WANTED—(a) Director of nurses and several staff nurses; city-county health department; generalized program; headquarters in college town of 60,000; salaries, \$3,500-\$3,700 and \$2,900-\$3,400 respectively; Middle West. (b) Public health nurses for positions in South America; knowledge of Spanish available. (c) School nurse; public schools of town of 15,000 near Chicago; approximately 1,600 students. (d) Visiting nurse to join staff of industrial company; Chicago. (e) Public health nurse to supervise newly-constructed outpatient department; Hawaii. **PH9-1** Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago 11.

WANTED—(a) Health coordinator to work in conjunction with health departments of several towns and with health service of four high schools; would serve as liaison person on community health projects and as health educator; newly-created position; \$3,800-\$4,000; East. (b) Health educator; city health department, Middle West; \$3,700-\$4,100; (c) Sanitary engineers experienced with drainage problems, insect control, water purification and sewerage disposal; knowledge of Spanish advantageous; South America. (d) Health educator; university appointment; duties consist of teaching undergraduate and graduate courses in health education; Ph.D. or M.D., required. **PH9-3**, Medical

Bureau (Burneice Larson, Director) Palmolive Building, Chicago 11.

WANTED—(a) Woman physician to join staff student health department, Middle Western university; recent graduate eligible; if maintenance desired, arrangements possible to serve as head of housing unit; duties include out-patient clinic work and supervising infirmary. (b) Public health physician to establish and maintain city physician's office; funds recently approved for staff consisting of public health nurse, laboratory and clerical assistants; \$8,000; winter resort town, South. (c) Physician to join staff of student health department; will consider part-time arrangement; if full-time, \$7,000—if half-time, \$3,500; middle western metropolis. (d) Director and associate director of university student health service; appointments carry faculty rank; 12 month year, month vacation annually; town of 25,000; West. (e) Young physician for position of director of health and physical education; public school department of health; staff of 12 nurses, 2 dentists and approximately 40 physical education instructors; enrollment of 10,000 students; faculty of 6,000; town of 75,000 located short distances from several large cities including university medical center. **PH9-4**, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago 11.

### Advertisement

## Opportunities Wanted

Young physician well qualified as health educator; B.S., M.D., and Master of Health degrees; several years, director of university health service where he has carried a rather heavy teaching load; for further information, please write Burneice Larson, Director Medical Bureau, Palmolive Building, Chicago 11.

Sanitary engineer; bachelor of science in civil engineering; Master's degree in public health engineering; since 1940 sanitary engineer with county department of health and part-time teaching (public health) in university; seeks greater responsibilities; for further information please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Public Health nurse—B.S. degree in public health nursing, considerable work toward Master's; five

years, metropolitan department of health; four years, school nurse and educational director; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Young dentist; D.D.S., M.S. degrees; recently received Master's degree in Public health; considerable research work on problem of dental caries; for further information please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Health educator; several years' experience in teaching the sciences before taking graduate training in health education; M.S.P.H., middle western university; eight years, director of health education, tuberculosis association; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

# NEWS FROM THE FIELD

## NOTE ON THE HEALTH CONGRESS OF THE ROYAL SANITARY INSTITUTE

TORQUAY, DEVON, ENGLAND; JUNE, 2-6, 1947

The Royal Sanitary Institute resumed in 1946 its series of annual Congresses, which had been interrupted by the war. The 1947 Congress, however, was the first since the war to which international delegations have been invited. A record number of 2,383 persons attended, of which 81 were overseas delegates\* from 37 countries.

The Royal Sanitary Institute may be regarded as a British cousin of the American Public Health Association, although differing considerably in its history and type of membership. The Institute was founded in 1876, four years after the American Public Health Association, and it now has an enrollment of slightly more than 7,000. From the first it was an organization of sanitarians in the broadest sense, rather than primarily a medical organization. Statistics are not available, but it is believed that less than one-fourth of the present membership is made up of physicians. There are a relatively large percentage of civil, architectural, and sanitary engineers, and a substantial number of sanitary inspectors. The number of women members, especially in the public health nursing field, is relatively small.

Like the American Public Health Association, the Royal Sanitary Institute

publishes a *Journal* (bi-monthly),† holds an annual Congress, and generally promotes interest in health activities. Local sectional meetings are also held at intervals. A function not paralleled by any organization in the United States is the holding of qualifying examinations for various types of health service workers. At present some fourteen different examinations are held, covering various aspects of the fields of health visiting (public health nursing), nursery nursing, and sanitary inspection. Although certificates granted by the Royal Sanitary Institute on the basis of these examinations do not have the official legal status of our state board examinations in medicine or nursing, they are in fact requirements for employment by health departments under regulations issued by the Ministry of Health. The Institute thus plays an important part in setting standards for health visitors and sanitary inspectors in the United Kingdom and to a considerable extent in the Dominions and Colonies.

The 1947 Congress was held in Torquay, Devon, on the south coast of England. Despite the general housing shortage in England, Torquay's hotels were able to accommodate the delegates without difficulty, perhaps because early June is well in advance of the peak vacation season. The town is built on steep hills rising sharply from a sheltered bay, and with the lush vegetation of this nearly frost-free corner of England, is a most scenic spot. The Mayor and his

\* The United States Government delegation included Dr. Martha M. Eliot, U. S. Children's Bureau (Chairman); Dr. Harry S. Mustard, Director of the Columbia University School of Public Health; Captain Arthur W. Loy, M.C., U.S.N., Assistant Naval Attaché at the London Embassy, and the writer (Vice-chairman). Dr. Mustard and Dr. Eliot also officially represented the American Public Health Association as President and President-elect, respectively.

† The Proceedings of the Congress will appear in the July and September issues (Vol. 68, Nos. 4 and 5) of the *Journal of the Royal Sanitary Institute*.

staff provided the utmost coöperation in making the Congress successful, and officially entertained the delegates at a reception and a garden party. As was customary of pre-war meetings, a special luncheon was given in honor of the overseas delegates.

In contrast to meetings of similar organizations as usually arranged in the United States, the Congress was run along lines which gave much time for individual discussions between members and leisure for recreational activities. Sessions were scheduled in the mornings only, from 10 a.m. to 1 p.m.; three or four sessions were held each morning concurrently. The typical session consisted of a 20 minute address by the president of the section, followed by two papers of 30 to 40 minutes each. Several short speeches, proposing votes of thanks or introducing speakers, were interspersed, leaving about one hour during which the floor was thrown open for discussion.

The Congress was divided into seven sections: Preventive Medicine, Engineering and Architecture, Maternal and Child Health, Veterinary Hygiene, Food and Nutrition, Housing and Town Planning, and Tropical Hygiene. The sessions on Preventive Medicine and Maternal and Child Health included papers on "The Scope of Public Health after 1948," "The National Health Service and the Public Health Service," and "The Present Position and Prospects in Whooping Cough Immunization," several papers on various aspects of infant mortality including one on care of premature infants, and a group of papers on public health and industrial nursing.

Environmental sanitation was discussed in papers on "Milk: A Food for Thought," "Meat Transportation," and "The Work of a Sanitary Inspector at a Busy Fishing Port," and was touched upon in papers of the Veterinary Hygiene Section such as "The Import-

tance of Cowshed Hygiene in the Transmission of Milk-borne Diseases," and of the Food and Nutrition Section in two papers on "The Microbiological Aspects of Food Quality."

The Tropical Hygiene Section heard a paper on *Anopheles* eradication in Cyprus, and an account of social welfare problems in tropical Africa.

The Engineering and Architectural groups discussed chiefly problems relating to slum clearance and development of planned housing "estates" (projects). These matters appear to be given more attention by public health workers in England than is commonly true in the United States; it is significant that the national agency dealing with housing is the Ministry of Health. A paper on "The Design and Location of Health Centres" was of especial interest to those concerned with development of these centres for the National Health Service.

Pervading the discussions of public health was the consciousness of the recently passed National Health Service Act of 1946, and its anticipated effects on the administration of public health, medical, and hospital services after the "appointed day" when the Act is to become operative, probably July 5, 1948. Not a word was said against the objectives and basic principles of the Act, which is to provide free and comprehensive public health, hospital, specialist, and general practitioner services to the entire population of England and Wales. Concern seemed to center around two general matters; first, the tripartite administration of the Service, and second, the danger of its administration being too far removed from the local level. Under the Act, preventive services will be administered by counties and county boroughs (roughly the equivalent of counties and large cities in the United States), general practitioner services will be administered by Executive Councils, each Council (with



rare exceptions) covering a county or county borough area, while hospital and specialist services will be the responsibility of Regional Hospital Boards. There will be approximately 140 administrative units in the first two groups, and 14 Regional Boards. It is evident that complex problems will arise in securing a properly integrated service. The Act provides devices for cross-representation at the various administrative levels, and the Medical Officer of Health could be a key person in coördinating the various health functions at the local level.

With respect to remote administration, there appears to be adequate provision in the Act for decentralization, but whether in fact a bureaucratic or a locally sensitive administration will be developed, will depend largely on the degree of responsibility delegated to the local bodies.

One of the most impressive aspects of the Congress was the large number of lay members of Local Authority Councils sent as delegates to the Congress. Many of the larger Authorities sent as delegates one or two members of their Public Health Committee as well as their medical officer of health and sanitary inspector. Some authorities sent only the chairman of the Public Health Committee: others only the medical officer of health. A high degree

of interest in, and in many cases knowledge of, health needs and practices was shown by some of these delegates. Councillors and aldermen taking part in the discussions added a flavor which tends to be lacking from professional meetings in the United States.

A useful feature of the Congress was printing the major papers and distributing them in advance to all the delegates. This gave the delegates opportunity to study the papers prior to delivery and to present well prepared comments in the discussion periods.

The small number of sessions, leaving afternoons and evenings free, gave adequate time for the informal meetings and personal contacts which are perhaps the most important phase of such a congress. On the other hand, there were sufficient formal conferences to permit a substantial number of delegates to express their views during the discussion periods.

Particular note should be made of the hospitality extended to the overseas delegates by officials of the Royal Sanitary Institute and the city of Torquay. Everything was done to make our attendance at the Congress professionally profitable and socially enjoyable.

BURNET M. DAVIS, M.D., SURGEON,  
USPHS

*Division of Public Health Methods*

---

INSERVICE TRAINING COURSE IN THE  
COLLECTION AND DISPOSAL OF  
GARBAGE AND REFUSE

The School of Public Health, University of Michigan, Ann Arbor, Mich., announces a two day Inservice Training Course in the Collection and Disposal of Garbage and Refuse to be held at the School of Public Health Building, University of Michigan, Ann Arbor, Mich., on October 27 and 28.

The course is designed especially for the benefit of public works officials.

However, others who are interested are invited to enroll and attend the course. The enrollment fee is \$5, which should be paid at the time of registration. Enrollment will be closed on October 20. Applications should be submitted to the School of Public Health, University of Michigan.

The course will consist of presentation of various aspects of garbage and refuse disposal by individuals expert in the various subjects, followed by group discussions. The subjects to be discussed

will include the responsibility for control, methods of collection, and equipment for collection, and various specific methods of disposal.

NATIONAL BUREAU OF STANDARDS  
ESTABLISHES DIVISION OF  
COMMODITY STANDARDS

Dr. E. U. Condon, Director of the National Bureau of Standards, recently announced the consolidation of the Divisions of Commercial Standards and Simplified Practices to form the new Division of Commodity Standards.

The bureau has been serving actively as a coördinator in the development of voluntary simplified practices—elimination of uneconomical variety in manufactured products—and in the preparation of commercial standards as typified by the work of the American Standards Association and the American Society for Testing Materials. The Division of Simplified Practices will continue both of these activities and in addition will carry on the Federal Specifications work, vital in the preparation of specifications for government purchases. Edwin W. Ely, formerly chief of the Simplified Practice Division, has been appointed chief of the new division.

VENTILATION OF GARAGES AND PLANTS

Adequate ventilation of plants, warehouses, and garages, to eliminate carbon monoxide and other dangerous gases from gasoline-powered engines can be assured if enough air is in circulation in such places, according to a recent report of the Bureau of Mines. The publication is based upon one of a series of investigations of the occurrence and effects of toxic gases in the minerals industry. Investigations conducted for several years by the Health and Safety Branch of the Bureau of Mines has disclosed the fact that many gasoline-powered engines used in coal mines and tunnels are unsafe because of the dangerous gases generated and the hazard con-

nected with the fuel. The same conditions may exist in garages. To determine the amount of air necessary for proper ventilation the investigators considered three factors: rate of fuel consumption, volume of exhaust gas, and the concentration of carbon monoxide in the gas.

Copies of the publication, *Ventilation Involved in the Use of Gasoline-Powered Equipment in Enclosed Spaces (Not in Mines or Tunnels)*, may be obtained free from the Bureau of Mines, Dept. of the Interior, Washington 25, D. C.

BUREAU OF DENTISTRY IN NEW YORK  
CITY HEALTH DEPARTMENT

A Bureau of Dentistry was recently created within the New York City Department of Health. Heretofore dental services have been provided through a division of the Bureau of Child Hygiene.

The director of the new division is Harry Strusser, D.D.S., who has been in charge of the dental division since 1929. Henry C. Sandler, D.D.S., is assistant director. The new bureau employs a total of 150 dentists and 141 dental hygienists.

DR. CAMERON HEADS AMERICAN  
CANCER SOCIETY

Charles S. Cameron, M.D., was appointed Acting Medical and Scientific Director of the American Cancer Society at the meeting of its Board of Directors in June. The appointment follows the resignation of A. W. Oughterson, M.D., Medical and Scientific Director and Vice President, who has served in this capacity since April, 1946.

Dr. Cameron came to the society in June, 1946, as Assistant Medical and Scientific Director. In January, 1947, he also assumed the duties of director of the Service Department.

SPECIALIST SERVICE TO OUTLYING  
TERRITORIES

On July 19, a group of five top staff

men from Cook County Hospital in Chicago took off from Minneapolis for Alaska. They were the first group in a project set up by the American Medical Association to take specialized service to the territories and Western Indian Reservations.

The specialists will carry with them facilities for a portable hospital and will spend a month in the territory.

In September, groups will visit Indian reservations in the West, and in December, 10 or 12 physicians will be sent to Puerto Rico and the Virgin Islands for similar services.

This is planned as a continuing project and more teams will be sent out next year.

#### "TRUSTEE" BEGINS PUBLICATION

The American Hospital Association announces the publication of a pocket size magazine for hospital governing boards to be called "Trustee." Editorially, it will be "educational, readable, and strictly pertinent to the realm of trustee responsibilities."

It is the result of the work of a special committee made up of Ray E. Brown, Superintendent of University of Chicago Clinics, Chairman; Graham L. Davis, Director, Hospital Division, W. K. Kellogg Foundation; R. O. D. Hopkins, Executive Director, United Hospital Fund of New York; and William B. Seltzer, Director, Mt. Sinai Hospital, Cleveland.

The price will be \$2.00 per year for member trustees and administrators and \$3.00 per year for other persons. The American Hospital Association, 18 East Division Street, Chicago 10, Ill.

#### FELLOWSHIPS FOR WOMEN

The American Association of University Women, 1634 I Street N.W., Washington 6, D. C., announces a group of fellowships for graduate study or research for the academic year 1948-1949. These fellowships are awarded in gen-

eral to candidates who have completed two years of residency on work for a doctorate degree or have already received such a degree. The greatest importance is attached to the project on which the candidate wishes to work.

There are two types of Fellowships:

1. The National Fellowships are open to American women for study in the United States and offer \$1,500, with one fellowship of \$2,000.

2. The International Fellowships are open to members of the International Federation of University Women for study in the United States or abroad. One fellowship will be awarded to a Latin American woman for study in the United States. The awards in the international group of fellowships range from \$300 to \$1,500.

For detailed information address the Secretary, Committee on Fellowship Awards. Closing date for applications is December 15.

#### PREVENTION OF DERMATITIS

The July, 1947, issue of *Industrial Hygiene Newsletter* carries two items of interest on the subject of dermatitis. The first, "Poison Ivy—Hazard of Vocation and Vacation," gives a brief report on the present status of preventive measures to protect against possible contact with the plant. It also makes some suggestions with regard to treatment. The final paragraph should be of interest to many—"Injudicious treatment of poison ivy is often worse than no treatment at all. It must therefore be emphasized that any severe case of poison ivy dermatitis should be cared for by a physician."

The second item is one of a series of discussions. This is part II entitled, "Occupational Dermatitis and Methods of Prevention—Cleanliness." Louis Schwartz, M.D., and Paul C. Campbell, Jr., M.D., the authors, explain the importance of cleanliness including the body and clothing in prevention of occupational dermatitis. They go further to

outline precautions that should be taken by certain persons for whom the usual cleaning agents might not be suitable.

The *Industrial Hygiene Newsletter* is published by the U. S. Public Health Service, Washington, D. C.

#### NEW YORK STATE CEREBRAL PALSY COMMISSION REPORTS

The year-old New York State Legislative Cerebral Palsy Commission recently made a preliminary report to the state legislature. It found that the State Department of Health carries over 4,600 such cases on its registers, that another thousand are under the care of the Department of Mental Hygiene, and that approximately one-third of all children in special classes in public schools are victims of cerebral palsy.

At present, although there is no known cure for those who have normal mentality (65 to 75 per cent of all), "there is perhaps no other group for whom rehabilitation to even a slight degree makes so much difference and is so important." The Commission has reached the following conclusions:

1. State care of cerebral palsy victims is inadequate and insufficient although its responsibility for this group is the same as for other disabled groups.
2. Specialized diagnostic and treatment centers should be available at an early age for every child afflicted.
3. Educational, medical, and therapeutic services should be expanded and integrated.
4. Inpatient care should be provided for those in need of such care.
5. At least one model center for diagnosis, treatment, and research should be established as soon as possible.
6. Specialized training for physicians, nurses, and teachers for this field should be stimulated.
7. The present formulae for state and federal assistance for the care of such cases should be restudied.

The first model center to be established will probably be at LeRoy, N. Y., on a fifty acre estate offered to the University of Rochester for that

purpose by Mr. and Mrs. Ernest L. Woodward. Operational costs for treatment services would be supplied by the state, and research and training would be conducted by the university's medical school, Strong Memorial Hospital staff, the National Foundation for Infantile Paralysis, and other groups.

#### ATOMIC RADIATIONS UNIT FORMED

Dr. J. G. Townsend, Chief of the Industrial Hygiene Division, U. S. Public Health Service, recently announced the formation of an Atomic Radiations Unit in the Chemical Section of the Division. Mr. Duncan Holaday, Engineer (R), is in charge of the new Unit.

In making announcement of this new activity, Dr. Townsend expressed the belief that many institutions and industries have been handicapped in their use of radioactive isotopes and high energy machines because of their lack of information about the safe handling of dangerous quantities of radioactive materials. The new Atomic Radiations Unit, working through industrial units in the states, will help institutions and industries evaluate their hazards and establish safe working conditions.

#### LANSING-INGHAM COUNTY HEALTH UNIT

The City of Lansing and the County of Ingham in Michigan became a consolidated county health unit on July 1. Its director is Roelof Lanting, M.D., who previously served as Lansing City Health Officer. The combined population (1940) of the city and county is about 130,000.

#### DR. KESSLER HEADS NATIONAL COUNCIL ON REHABILITATION

The election of Henry H. Kessler, M.D., as President of the National Council on Rehabilitation (1705 Broadway, New York 19) was recently announced.

Dr. Kessler is Chairman of the Council on Industrial Health of the American

Medical Association, and Consultant in Orthopedics and Prosthesis Services to the Federal Office of Vocational Rehabilitation, and a member of the New Jersey State Rehabilitation Commission. His "cineplastic amputation" technique is unique in the field of surgery. He spoke before the British Council on Rehabilitation in London on July 25.

#### FEDERAL GRANTS FOR MENTAL HEALTH RESEARCH

The first federal grants for research in mental health under the new National Mental Health Act—25 grants to institutions or individuals in 9 states—were recently announced by Thomas Parran, M.D., Surgeon General of the U. S. Public Health Service.

This program was authorized by the U. S. Congress in 1946 and received an appropriation of 7½ million dollars on July 8, 1947. In addition to the mental health activities of the Public Health Service, this will finance a threefold program of research on mental illness, development of local mental health facilities, and training of mental health personnel.

#### "EYE-BANK" SET UP IN NEW ORLEANS

An affiliated "Eye-Bank" has been organized in New Orleans, La., which will have the coöperation of the Louisiana State University Medical School and the Tulane University Medical School and Hospital, it was announced recently at national headquarters of The Eye-Bank for Sight Restoration, Inc., 210 East 64th Street, New York. Other affiliated Eye-Banks are functioning in Boston and Chicago.

#### PHARMACY SECTION IN HOSPITAL DIVISION, U.S.P.H.S.

A newly created pharmacy section has been established in the Hospital Division of the U. S. Public Health Service for the further development of the pharmaceutical activities in the Marine

Hospitals and their adjunct medical relief stations. This action brings an organized pharmacy service for the first time to the oldest of the hospital groups operated by the federal government.

The new pharmacy service in the Hospital Division will be under the direction of George F. Archambault, graduate and former faculty member of the Massachusetts College of Pharmacy.

#### DR. SAYERS LOANED TO UNITED MINE WORKERS

R. R. Sayers, M.D., Medical Director, U. S. Public Health Service, and Director of the U. S. Bureau of Mines since 1940, has been granted leave without pay to accept the chairmanship of the medical board recently established by the Trustees of the Welfare and Retirement Fund of the United Mine Workers of America. In this position, Dr. Sayers will advise trustees of the miners' fund on health and medical problems. He will also assist state and local public health authorities, as well as coal operators and unions, in carrying out recommendations contained in the Medical Survey of the Bituminous Coal Industry issued last spring by Rear Admiral Joel T. Boone.

Assignment of Dr. Sayers to this position is in line with the Public Health Service policy of making expert personnel available to official and voluntary non-profit organizations to assist in the developmental stages of new and significant health undertakings.

#### CHILDREN'S BUREAU GRANT AT HARVARD SCHOOL OF PUBLIC HEALTH

To provide for expansion of the educational program and the facilities for training in the field of maternal and child health and related branches of public health, the Harvard School of Public Health has received a grant of Children's Bureau funds from the Massachusetts Department of Public Health. To the basic disciplines will be added

further training in nursing, social service, and especially the administrative aspects of child health. Further field training facilities will also be developed.

JOURNAL OF THE INTER-AMERICAN ASSOCIATION OF SANITARY ENGINEERS  
Volume I, No. 1 of the *Journal of the Inter-American Association of Sanitary Engineers* was published in July, 1947. As the name indicates, this is the official *Journal* of the recently organized Inter-American Association of Sanitary Engineers (see *A.J.P.H.* of July, 1947, p. 955, for an announcement of its formation).

The lead article in the first issue of the new *Journal* is "The Sanitary Engineer Looks Forward," by Abel Wolman, Dr. Eng., previously published in professional magazines of the United States, including the *American Journal of Public Health*, November, 1946. The *Journal* uses both the English and Spanish versions of all original articles; for articles already published elsewhere, only the language is used in which the article has not appeared.

#### NEW ARMY MEDICAL CENTER

What is planned to be the greatest medical research center in the world will be built at Forest Glen, Md., by the Corps of Engineers for the Office of the Surgeon General, AUS, according to a recent announcement made by Major General Raymond W. Bliss, the Surgeon General. In keeping with technological advances in all fields, the center will be equipped to anticipate and meet the medical problems of the future as well as to cope with those of the present.

Designated as the "Army Medical Research and Graduate Training Center," the project will consist of a 1,000 bed general hospital capable of expansion to 1,500 beds; the Army Institute of Pathology building; the Army

Medical Museum and Center Administration building; Central Laboratory Group buildings; and the Army Institute of Medicine and Surgery. A working library, animal farm, staff quarters, and other buildings are included in the plans.

#### PERSONALS

##### Central States

FRANK F. BOWMAN, M.D.,† on May 1 retired as Health Officer of the city of Madison, Wisc., a position he has held for 19 years. He was honored at a farewell dinner given by present and former employees of the city health department.

LEWIS DODSON,\* formerly Director of Public Health Practices for the National Sanitation Foundation at the University of Michigan School of Public Health, Ann Arbor, became Director of Environmental Sanitation of the City-County Health Department, Denver, Colo., effective September 1.

SOPHIE FLVOLD, R.N.,† was appointed on August 1 as Director of the Public Health Nursing Association of Des Moines, Ia. She was previously assistant Director of the Dayton, Ohio, Visiting Nurse Association for 9 years.

MARION I. MURPHY,† has been appointed Associate Professor of Public Health Nursing, University of Michigan, Ann Arbor, Mich., as of August 1. Miss Murphy was formerly Assistant Director of the Bureau of Public Health Nursing, Michigan Department of Health.

A. NEUWIRTH, M.D.,† is at present stationed in Germany as the Medical Director for Germany for the American Joint Distribution Committee. Dr. Neuwirth was formerly Health

\* Fellow, A P H A  
† Member, A P H A.

Officer, Iron-Ontonagon Health District, Mich.

J. BURRIS PERRIN, M.D.,† became Deputy Health Commissioner and Director of the Division of Maternal and Child Health of the Peoria, Ill. Health Department on July 1. He was most recently in the Medical Corps, AUS, and Director of the Division of Maternal and Child Health and Crippled Children in the Colorado Department of Health.

A. LLOYD TAYLOR, M.D., has accepted a position as Research Supervisor in the Wyandotte Chemicals Corporation Research Laboratories, Wyandotte, Mich., where his experience will be applied in the field of industrial detergents. Dr. Taylor has had many years experience in this field both as Director of Research for Oakite Products and as Director of the Department of Chemistry for Pease Laboratories, New York.

### Eastern States

ANNA M. BANUS, nutritionist in the Berkshire district office of the Massachusetts Department of Public Health, has resigned to accept a position as assistant professor in the Department of Home Economics of Western Reserve University, Cleveland, Ohio.

FRANK E. COUGHLIN, M.D.,† has been named County Commissioner of Health of Rensselaer County, N. Y.

WILLIAM P. FORREST, M.D., has been appointed assistant director of the WHO Interim Commission Headquarters Office in New York City. He was chief medical officer with the United Nations Relief and Rehabilitation Administration's mission to the Ukrainian Soviet Socialist Republic.

SUE T. GOULD, M.D.,\* Columbia County, N. Y., Commissioner of Health has resigned that post, effective October 1.

GRANVILLE W. LATIMORE, M.D., M.P.H.,\* Director of the Education Department, American Cancer Society, New York, N. Y., has resigned to accept appointment as Director of the Bureau of Health Education, New York State Department of Health, Albany, N. Y.

MADELEINE LAY, has been appointed Education Secretary of the American Association of Psychiatric Social Workers, New York, N. Y., to act as an adviser to schools of social work and to social work departments of universities in setting up standard curricula for the training of psychiatric social workers. This work has been made possible by a grant from the Commonwealth Fund for 2 or more years.

JAMES E. PERKINS, M.D.,\* was appointed Deputy Commissioner of Health of New York State. Associated with the New York State Department of Health since 1934, Dr. Perkins has served successively as Epidemiologist, District State Health Officer, and as Director of the Division of Communicable Diseases. On January 1, 1946, he was appointed Deputy Commissioner by former Commissioner EDWARD S. GODFREY, JR., M.D.,\* recently retired.

DAVID D. RUTSTEIN, M.D.,\* has been appointed Professor of Preventive Medicine at Harvard Medical School, Boston, Mass., succeeding JOHN E. GORDON, M.D.,\* who since July 1, 1946, has been head of the department of epidemiology in the School of Public Health. Since 1946, Dr. Rutstein has been Medical Director of the American Heart Association and the American Council on Rheumatic Fever and a consultant to the Joint Research and Development Board of the Departments of War and Navy.

CHARLES D. SHIELDS, M.D.,† has resigned the position of Commissioner of Health of the City of Buffalo,

N. Y., to accept a commission as major in the U. S. Army Medical Corps. EDWARD B. BUKOWSKI, M.D.,† who has been Buffalo's deputy health commissioner, has been appointed acting commissioner.

### Southern States

J. C. CANADA, M.D., was named Director of the Pontotoc County Health Department, Ada, Okla., effective July 3.

FREDERICK A. JOHANSON, M.D., has been named Director of the U. S. Marine Hospital (National Leprosarium) at Carville, La., by the U. S. Public Health Service. He has been with the institute for over 20 years. Dr. Johanson succeeds G. A. FAGET, M.D.,† former director, who died recently.

VICE ADMIRAL ROSS T. MCINTIRE, wartime Surgeon General of the U. S. Navy, and formerly White House physician, has been named director of the new National Blood Program of the American Red Cross. Dr. McIntire will have supervision of the most far-reaching health program in the peacetime history of the Red Cross being undertaken in direct response to the urgent need of the medical profession for blood in saving of life as well as in treatment and prevention of disease.

MASON ROMAIN, M.D.,\* became Director of the Division of Cancer Control of the Virginia State Health Department July 1, after serving as full-time public health officer in Petersburg, Va., since 1941.

WILLIAM B. ROSSMAN, M.D., has been appointed Director of the Bureau of Mental Health of the West Virginia State Department of Health. Plans for the new bureau were completed by the Public Health Council at a meeting in Charleston June 30.

MARY JANE SCOTT, Senior Nutritionist with the Arkansas State Health De-

partment since 1942, has resigned to become a Professor of Home Economics Education at the University of Arkansas.

GEORGE L. WINN, M.D.,† resigned as Director of the Comanche County Health Department, Lawton, Okla. effective June 30.

### Western States

PHILIP A. BEARG, M.D.,\* has resigned as Health Officer of San Luis Obispo County, California.

MAURICE BRODSKY, M.D., of the U. S. Public Health Service, was recently appointed assistant chief of the Hawaiian Tuberculosis Bureau. He replaces WILLIAM MURLIN, M.D., who joined the staff of Leahi Hospital, Hawaii.

LLOYD FLORIO, M.D., Dr.P.H.,\* Professor of Public Health and Preventive Medicine at the University of Colorado Medical Center has been loaned to the city of Denver for a 6 month period to reorganize the City and County Health Department on the basis of a comprehensive survey recently completed by EDWARD G. MCGAVRAN, M.D.,\* new dean of the University of North Carolina School of Public Health.

### CHANGES IN HEALTH PERSONNEL IN STATE OF OREGON:

F. HERBERT COLWELL, M.D.,† has been reappointed to the post of Director of the Vital Statistics Section of the State Board of Health. Dr. Colwell held the position until early this year, but resigned to accept an offer in Washington State.

LAURA P. WELLS,† has resigned as Nutrition Consultant for the Maternal and Child Health Section to supervise the school lunch program of the State Department of Education.

\* Fellow, A.P.H.A.  
† Member, A.P.H.A.



JAMES V. HAWKINS,<sup>†</sup> is the new Sanitarian in Klamath County, replacing LLOYD SEALEY, who resigned in May. Mr. Hawkins has served with the U. S. Public Health Service in Kansas City and as a sanitarian in Alaska, Washington State, and Texas.

WILLIARD J. CLOYES has resigned as Sanitarian of Lane County, a position he held since 1940 to become city manager of Springfield, Ore.

G. D. CARLYLE THOMPSON, M.D.,<sup>†</sup> was appointed Director of the Division of Preventive Medical Services for the State Board of Health, August 1. Dr. Thompson also became State Epidemiologist. He was the first Maternal and Child Health Director of the State Board of Health, having served in that capacity from 1937 to 1940 and during the war was attached to the Surgeon General's Office in Washington, D. C.

EDWARD A. REINKE,\* has been appointed Chief, Bureau of Sanitary Engineering, California State Health Department, effective July 1. Mr. Reinke's appointment follows 27 years of service in the Bureau of Sanitary Engineering.

F. E. WIGGINS, M.D., has replaced FRANK M. GARDNER, M.D., as the Health Officer of the City of San Bernardino, Calif.

#### Foreign

C. K. CHU, M.D.,\* has been named assistant director of Field Services for China, WHO Interim Commission. Dr. Chu received his M.D. degree from the Peking Union Medical College and a degree of Doctor of Public Health from Yale Medical School. He has been granted one year's leave from his post as director

of the Chinese National Institute of Health to work with WHO.

DOMINGO F. RAMOS, M.D.,\* of Havana, Cuba, left New York on July 30 for a tour of Latin American countries in connection with the emergency feeding program for children in war devastated countries. Dr. Ramos, who serves on the faculty of the Medical College at the University of Havana, was formerly Minister of Health of Cuba.

#### Death

GUY HENRY FAGET, M.D.,<sup>†</sup> for 25 years a distinguished officer of the U. S. Public Health Service, and noted for his pioneer work in treating leprosy with sulfa drugs, died July 17 in the U. S. Marine Hospital, New Orleans, La.

#### CONFERENCES AND DATES

- American Association for the Advancement of Science, Chicago, Ill. December 26-31.
- American Dietetic Association. Philadelphia, Pa. October 13-17.
- American Public Health Association—75th Annual Meeting. Atlantic City, N. J. October 6-10.
- American Public Welfare Association. Annual Round Table. Cleveland, Ohio. December 3-7.
- American Public Works Association. Jacksonville, Fla. October 5-8.
- American Water Works Association:
  - Four States Section. Washington, D. C. November 19-21.
  - Iowa Section. Cedar Rapids, Iowa. October 9-11.
  - Joint Meeting—Florida and Cuban Sections. St. Petersburg, Fla. November 20-22.
  - Missouri Section. Governor Hotel, Jefferson City, Mo. October 27-28.
  - New Jersey Section. Atlantic City, N. J. November 6-8.
  - North Carolina Section. Greensboro, N. C. November 10-12.
  - Southeastern Section. Atlanta, Ga. November 3-5.
  - Southwest Section. Amarillo, Tex. October 13-15.
  - Virginia Section. Roanoke, Va. November 17-18.

\* Fellow, A.P.H.A.

† Member, A.P.H.A.

# American Journal of Public Health and THE NATION'S HEALTH

---

Volume 37

November, 1947

Number 11

## The Place of Nutrition in a Public Health Program\*

WILSON JAMESON, K.C.B., M.D., F.A.P.H.A. (Hon.)

*Chief Medical Officer, Ministries of Health and Education, London, England*

THE study of nutrition has extended over a longer period than the 75 years covered by these meetings of the American Public Health Association, and both our countries have made material contributions to the advancement of this branch of knowledge. Though much fundamental research still remains to be done, we now know enough to enable us to say how various population groups should be fed if health is to be maintained and, indeed, made more robust. This is of the first importance, for good nutrition easily heads the list of objectives in a public health program.

The recent world war made it necessary for Britain to prepare a plan for national nutrition—no easy task for a country that, with its present density of population, cannot possibly be self-supporting. It was decided that the Ministry of Health should be responsible for advising the Government on nutritional policy from a scientific point of view and that the Ministry of Agriculture should endeavor to produce food,

and the newly created Ministry of Food to import and distribute food, in accordance with such advice. We had an interdepartmental committee of officers that worked quietly behind the scenes and insured that no conflicting advice would be offered to the Ministers concerned.

The requirements of the various sections of the population were defined in terms of nutrients and the amounts of different foods necessary to supply these nutrients were estimated. Production and import programs were planned accordingly. Thus the newer knowledge of nutrition was applied for the first time, on a nation-wide scale, to the feeding of the people in Britain.

Practically everyone in Britain was employed on war work of one kind or another, and wages were reasonably high. The manufacture of all goods except those strictly necessary was prohibited, so people had little else than food on which to spend their earnings—and often not too much of that. The position is much the same today.

The main steps taken by Government were as follows:

1. *Subsidies*—It was essential for us

\* Presented before the American Public Health Association at the Seventy-fifth Annual Meeting in Atlantic City, N. J., October 7, 1947.

to produce as much food at home as we could, therefore subsidies of all sorts were given to farmers.

Again, food had to be sold at prices comparable with those existing before the war; otherwise wage increases would have got out of hand. Accordingly much of the food purchased by Government at fairly high prices abroad was sold to the public below cost.

In 1946-1947 some £345 million were spent by the Government on these subsidies. Had they been removed, the cost-of-living index, which in the middle of that year stood some 31 per cent above the September, 1939, figure, would have been about 55 per cent above. The food index alone would have increased from 22 per cent to about 60 per cent above that of the immediate pre-war period.

2. *Rationing*—Rationing began in January, 1940. It was based on the principle that all essential foods, even if in short supply, should be equally available to everyone to an extent necessary to maintain health, and at controlled prices. The foods so dealt with were meat, bacon, cooking fat, butter and margarine, cheese, tea, sugar, and preserves.

At the end of 1941, what was known as the "points" scheme was introduced. Every person was entitled to a certain number of points monthly in exchange for which he could purchase a number of articles of food in short supply such as canned meat, fish, fruit and vegetables, and certain cereals. This scheme added palatability and variety to an otherwise rather drab diet and was made possible largely by the generous help of the people of North America.

In 1942 a "personal points" scheme gave everyone a small personal allocation of candies—I along with most other fathers benefited but little from this gesture.

Other foods such as milk and eggs were not rationed but were controlled

to this extent, that the public could purchase only the amounts advertised from time to time. Milk frequently fell as low as two pints per person per week. Bread was never rationed during the war—though it is now.

3. *Communal feeding*—In the latter part of 1940 local authorities were encouraged to establish what were called "British Restaurants" at which substantial meals could be obtained at cost price without the surrender of any coupons. Similar canteen arrangements were extended to factories and these were subsequently made compulsory in factories where more than 250 persons were employed. This arrangement was criticised by some who thought that no food should be provided in a communal eating place without the surrender of coupons. It was never intended, however, that the basic industrial ration should meet the needs of those who were working often at hard and unaccustomed tasks away from home. A good mid-day meal at such establishments went far to relieve the household supply, and was eaten mainly by those who really needed the additional food. At the same time an extra ration of cheese was made available for workers for whom canteen facilities were not available, such as those working on the land or in coal mines. There are still more than 800 of these "Civic Restaurants," as they are now called, in operation by local authorities and more than 12,000 factory canteens.

4. *Priority classes*—These were pregnant women, nursing mothers, and children up to school-leaving age. The schemes devised for these groups were known as the Welfare Foods Service and the School Milk and Meals Service. Invalids were also given special privileges and their requirements were attended to by a Special Diets Advisory Committee of the Medical Research Council. All these schemes are still in being.

The Welfare Foods Service is concerned with mothers and with children under 5 years of age. As soon as a woman knows she is pregnant she draws a ration book for her unborn child, on presentation of a certificate from a doctor, a midwife, or a public health nurse. She is then entitled to 7 pints of milk a week at less than one-third the market price, or free if she cannot afford to pay. She may also obtain free cod liver oil or vitamin A and D tablets and, for a small payment, a supply of concentrated orange juice. Additional eggs and meat are also allowed her. After the baby is born the mother and child between them may get as much as 14 pints of milk a week, together with vitamin supplements, until the child is a year old. After that the allowance is 7 pints of milk a week for the child till he is five years old and, of course, the normal vitamin supplements. Up to the age of 2 years the child may have national dried milk if it is preferred, as well as an extra allocation of eggs.

So far as milk is concerned the scheme has been about 100 per cent successful, but the "take up" of the orange juice, the cod liver oil, and the vitamin tablets has not been so satisfactory.

When the child reaches school age, i.e., 5 years, he loses the welfare foods but is entitled to the School Milk and Meals Service. He gets  $\frac{1}{3}$  pint of milk in school in the middle of the morning and another  $\frac{1}{3}$  pint in the afternoon if he wants it. Unfortunately the afternoon milk has had to be discontinued temporarily on account of shortage of supplies. In addition, between the ages of 5 and 18, he is entitled to  $\frac{1}{2}$  pint of milk at home every day at the full price. All school milk is now free—over 92 per cent of children in public and private schools are having it.

The school children's milk amounts to about 50 million gallons a year. If this is added to the welfare milk, the

total is 230 million gallons of free or cheap milk for mothers and children, representing about 40 per cent of all supplies.

School dinners in special school canteens are being rapidly extended. At present just over 50 per cent of children attending State-aided schools benefit, but it is intended as soon as may be to provide dinners free for all school children—just now a charge is made for the cost of the food only, roughly about 5d. a meal. Every effort has been made to provide dinners of the highest possible nutritional standard. Extra meat, fat, sugar, and skimmed milk powder have been allowed and the calorie value of the meal for the older children is about 1,000, for the younger 750.

A scheme of family allowances has been introduced in Britain; for each child except the first the parents receive a cash allowance of 5/- a week. There was a considerable demand for a bigger cash allowance but, rather than agree to this, Government decided to give additional benefits in kind by maintaining permanently the Welfare Foods Scheme and the School Milk and Meals Scheme.

5. *Fortification of food*—Margarine had vitamins A and D added to it in January, 1940, to bring its value up to that of summer butter. Later on the amount of vitamin D was increased. This vitamin was also added to national dried milk in 1945 as a safeguard against rickets. Flour has not been fortified. Instead, we have had a national loaf made of 80 to 85 per cent extraction flour, with some calcium added to neutralize the effects of phytic acid, which apparently interferes with the absorption of calcium and iron.

6. An educational campaign on a large scale was undertaken by Government—through the press, the radio, on the movies, and by local health demonstrations—to tell the public about the foodstuffs available and to encourage

use them. This was an essential element in the Government program and was generally much appreciated.

#### EFFECTS OF THE WARTIME FOOD POLICY

1. *Consumption of food*—Before the war the consumption of the more expensive and nutritionally more valuable foods rose with income. The poorest families were generally those with large numbers of children and among them the consumption of those valuable foods was lowest. The war altered this. Full employment with good wages and food subsidies, together with controlled prices, made it possible for even the poorest families to secure a good diet.

Here are some comparisons of 1945 with the period 1934–1938:

Milk consumption	rose	by	30	per	cent
Potatoes	"	"	58	"	"
Bread	"	"	21	"	"
Vegetables	"	"	22	"	"
Sugar	fell	"	33	"	"
Meat	"	"	23	"	"
Fats	"	"	20	"	"

2. *Health*—The war seemed to offer a wonderful opportunity to establish the value of various methods of assessing the nutritional state of samples of the population. We had generous help from the Rockefeller Foundation in this connection, and numbers of elaborate surveys based largely on laboratory technique were undertaken. I wonder how much we have learned from all these. For my part I think the clinical assessments carried out by my good friend and your well known expert, Dr. Sydenstricker, were of more practical value than many of the complicated studies made in Britain and on the continent of Europe.

Anyhow, for what they are worth, here are some of the results of such surveys and assessments as we could make with the means at our disposal:

a. Clinical examination revealed malnourishment in less than 1 per cent of a large sample of the population.

b. A survey carried out by the Medi-

cal Research Council of 16,000 people of all ages and occupations showed, from hemoglobin estimations, a decline in the incidence of anemia in women and children.

c. In 1940–1941 the growth rate, i.e., the height and weight increases, of children aged 4–14, was lower than before the war. By 1943, however, the rate was better than pre-war, and this improvement has been maintained up to 1946.

d. *Dental caries*—I think it is generally accepted that the incidence of dental caries is considerably influenced by diet. I have no figures for the country as a whole but here are the results of careful dental inspection of school children in Cambridge and in London. In Cambridge, in 1938, the percentage of temporary teeth found to be carious was 21.5 and only minor changes were recorded in 1939, 1940, and 1941. In 1942, however, the figure was 14.3, in 1943 it was 13.9, and in 1944 it had fallen to 10.8.

In London, Lady Mellanby made careful surveys of the dental condition of comparable groups of 5 year old children in 1929, 1943, and 1945. She found that between 1929 and 1943 a great improvement had taken place both in the structure of the deciduous teeth and in their resistance to decay. In 1943, 22 per cent of the children were "caries free" as compared with about 5 per cent in 1929. In 1945 she found the individual teeth significantly better in structure and with less caries than in 1943 while the percentage of carious teeth showing arrest of the disease was almost twice as large in 1945 as in 1943. She attributes the improvement to the increased calcifying properties of the diet particularly of pregnant women, infants, and young children. She has just told me that the improvement was still maintained in 1946.

e. *Vital statistics*—The work of Stuart, Burke, and their colleagues in Boston, and of Ebbs, Tisdall, and others

in Toronto, and of the People's League of Health in England, showed that the health of mothers and of infants and the incidence of complications in pregnancy and childbirth are influenced for good by improvement in the mother's diet. We did what we could, as I have told you, to apply these findings on a nation-wide basis. We did what we could, also, to secure as good conditions as possible for women during the antenatal and lying-in periods, though our good intentions were apt at times to be disturbed by bombs and rockets. Here are the relevant figures for England and Wales for 1945 as compared with those for 1938:

1. Maternal mortality (excluding abortions) declined by 46 per cent—excluding infection the decline was 38 per cent.

2. The stillbirth rate declined by 28 per cent.

3. The infant mortality rate declined by 13 per cent.

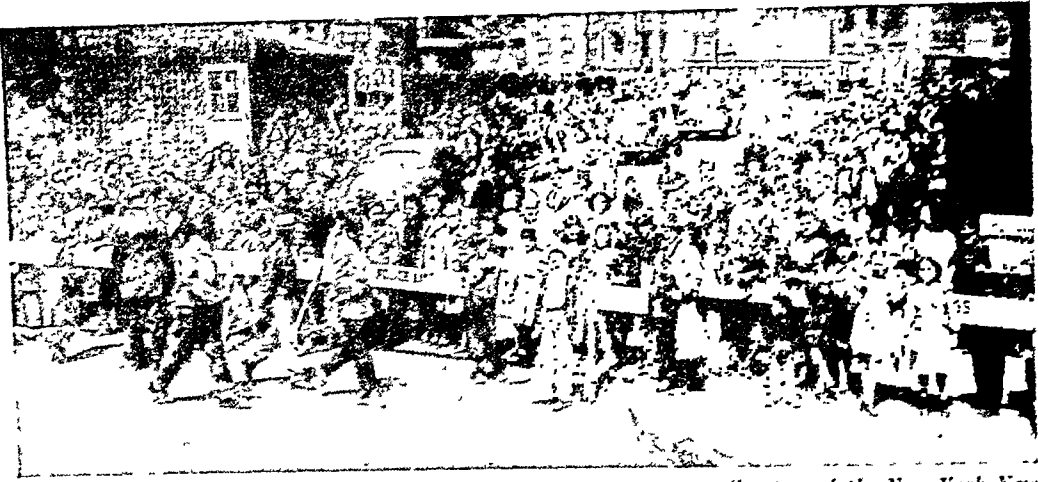
4. The neonatal mortality rate declined by 13 per cent.

In 1946 the fall continued in all these rates and each of the new figures was the lowest ever recorded. I have no doubt whatever that these results are due in the main to the priorities in essential foodstuffs granted to the mothers and children of Britain under a wise system of wartime rationing.

The fate of adolescents, heavy manual

workers, housewives, and single persons living without canteen facilities was not so good. It is not too good now for the non-priority classes after more than two years of so-called peace. Nutrition is not merely a matter of calories and vitamins. There are associated indefinable psychological elements as well. It is hardly surprising that a presumably victorious nation whose whole resources were expended on the war effort should experience some degree of psychosomatic disorder when, at this late stage, its bread has had to be rationed and whose belt has had to be tightened yet another notch or two. All this will pass, of course, and better days will come. We have at least this to be thankful for—and here I quote the words of Lord Woolton, a great Minister of Food—spoken in 1942: "I think we shall be able to say when the war is over that as a result of the application of scientific knowledge to food we have enabled the next generation, which has to build a new age and which indeed has a formidable task before it, to approach the work with healthy bodies. I believe we shall go through this war with no malnutrition amongst the children of the nation. That is one of the things for which we are working and praying, and I hope we shall succeed."

For my part, I hope I have shown you that we have succeeded.



*Courtesy of the New York Times*

Waiting to be vaccinated. New Yorkers form line outside of the Brooklyn Headquarters Building of the Department of Health.

## An Outbreak of Smallpox in New York City\*

ISRAEL WEINSTEIN, M.D., F.A.P.H.A.

*Commissioner of Health, City of New York, N. Y.*

### THE OUTBREAK

ON February 24, 1947, Eugene Le Bar, a '47 year old merchant who had lived in Mexico for six years, started a bus trip from Mexico City to New York City. Ordinarily, such an occurrence would not merit any particular attention, but in this case, it initiated a chain of events that led to headlines in papers throughout the country, hourly bulletins on the radio, laboratories working on a 24 hour schedule to produce vaccine, and hundreds of thousands of people standing on line for hours in order to enter a health center, hospital clinic, or police precinct. The arrival of a sick man in New York City caused millions of people to be vaccinated.

Le Bar was apparently well when he entered the bus, but that evening he be-

came ill. The symptoms were rather mild, consisting of little more than headache and pain in the back of his neck. Two days later he developed a rash. In order to relieve the headache, he took large amounts of a proprietary headache powder as well as aspirin. He arrived in New York City on March 1 and registered at a midtown hotel. Although he was not feeling well, he did a little sightseeing and also walked through one of the large department stores.

On March 5, he entered Bellevue Hospital where he remained until March 8. Because of the rash, he was transferred to Willard Parker Hospital, the communicable disease hospital in Manhattan. There, four diagnoses were considered—drug eruption, erythema multiforme, Kaposi's varicelliform eruption, and smallpox. Smallpox was rejected as the diagnosis because there was denial of exposure to the disease, a well developed vaccination scar, and an

\* Presented before the Epidemiology Section of the American Public Health Association at the Seventy-fifth Annual Meeting in Atlantic City, N. J., October 8, 1947.

atypical rash. Le Bar had a successful vaccination in childhood and an unsuccessful one about a year previous to his leaving Mexico. Biopsy of the skin lesions was done, but no Guarnieri bodies were seen in formalin-fixed material. Later when the diagnosis of smallpox had been made in contacts, other sections from the same biopsy material showed the characteristic Guarnieri bodies of smallpox.

The diagnosis of toxic eruption due to a drug was made because the patient had taken medication which often causes a rash in susceptible individuals. On March 10 he died, and at autopsy multiple hemorrhages were found throughout the viscera. The liver was soft and friable, the spleen was large, and there were hemorrhages in the medulla of the adrenal glands. The lungs were also hemorrhagic, and on microscopic section alveolar hemorrhages were noted.

Among the patients who were in Wil-

lard Parker Hospital at the same time as Le Bar were Ismael Acosta, age 27, with mumps, and a 22 months old girl suffering from croup. Neither of these patients had ever been vaccinated, and both were discharged from the hospital upon recovery from their illnesses. On March 19, the girl developed a rash and on March 21 was readmitted to Willard Parker Hospital with a diagnosis of chickenpox. On March 22 Acosta, who was working at Bellevue Hospital, also developed a rash and was admitted to the dermatology ward of that hospital. On March 27 he was transferred to Willard Parker as a case of possible chickenpox.

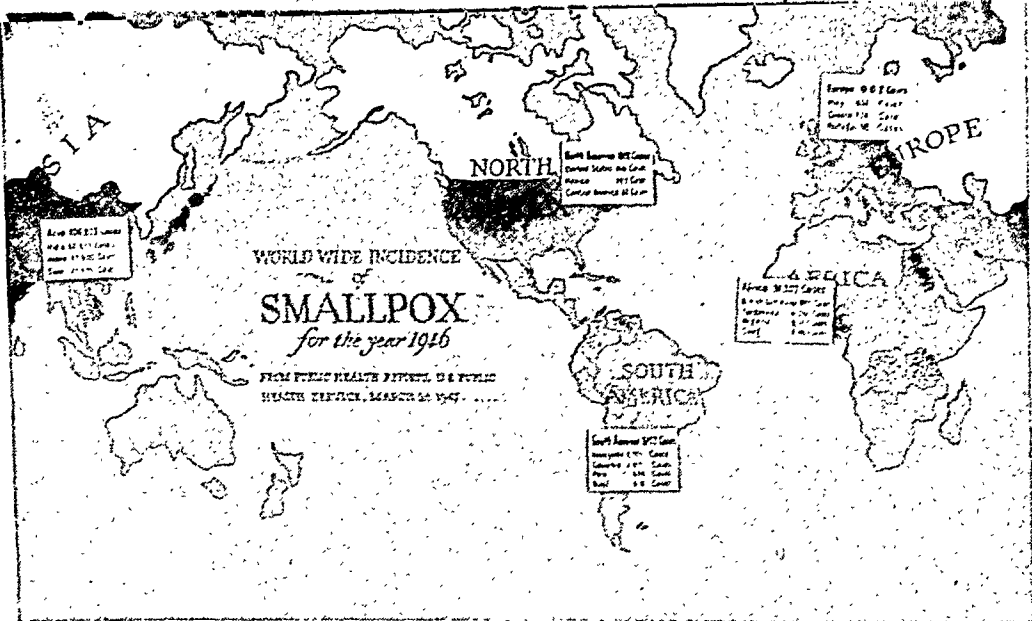
Because in neither instance did the rash appear to conform to that of chickenpox, a tentative diagnosis of smallpox was made. This diagnosis was later confirmed by Dr. Joseph Smadel at the U. S. Army Medical School Laboratory and Dr. Robert F. Parker at Western Reserve University. Fluid



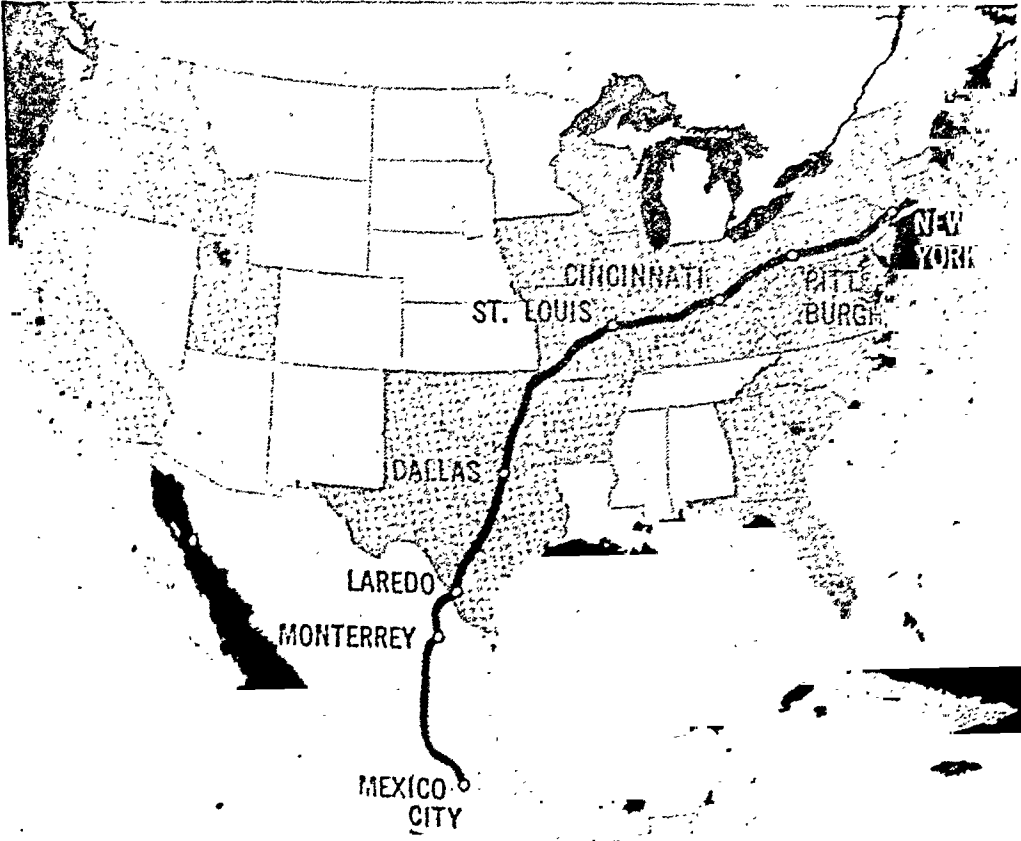
*The New York Times*  
Vaccinations being given at the Headquarters building of the Department of Health.  
For more than two weeks emergency clinics were operated throughout the city.



WHETHER YOU HAVE OR STAY AT HOME *You need protection against* **SMALLPOX**



World-wide incidence of smallpox, 1946.



Disease might have spread to 29 states (shading) if potential carriers had been infected. Line from Mexico to New York is Le Bar's bus trip.

Courtesy of Life

taken from the pustules of the two patients had been sent to them for laboratory examination. The material had been inoculated into the chorio-allantoic membranes of chick embryos. The report received showed that the membranes were covered with numerous lesions characteristic of smallpox infection. Complement-fixation of these membranes against a known positive anti-vaccinal rabbit serum was strongly positive.

The moment that smallpox was suspected, all employees and patients at the Willard Parker Hospital were vaccinated. The case of Eugene Le Bar was carefully reviewed, further study of the skin lesions was made, and the diagnosis of smallpox was established. It was now evident that he had been the source of infection for the other two cases. All of them had been in the same building, Le Bar and the baby on the ground floor and Acosta on the seventh floor. A search was made for all possible contacts with Acosta and the baby. These were immediately vaccinated, as well as employees and guests still present at the hotel at which the Le Bars had stayed. Guests who had left the hotel were located and were instructed to be vaccinated at once.

A boy  $2\frac{1}{2}$  years of age, never vaccinated, who was in Willard Parker Hospital for whooping cough during Le Bar's stay, developed a rash on March 27. The diagnosis of smallpox in this case was confirmed by the laboratory.

On April 6, Acosta's wife, age 26, was admitted to Willard Parker Hospital with fever. She developed a rash the next day, and died of smallpox on April 12. Although Mrs. Acosta was vaccinated as soon as it was known that her husband had smallpox, she apparently had already contracted the disease.

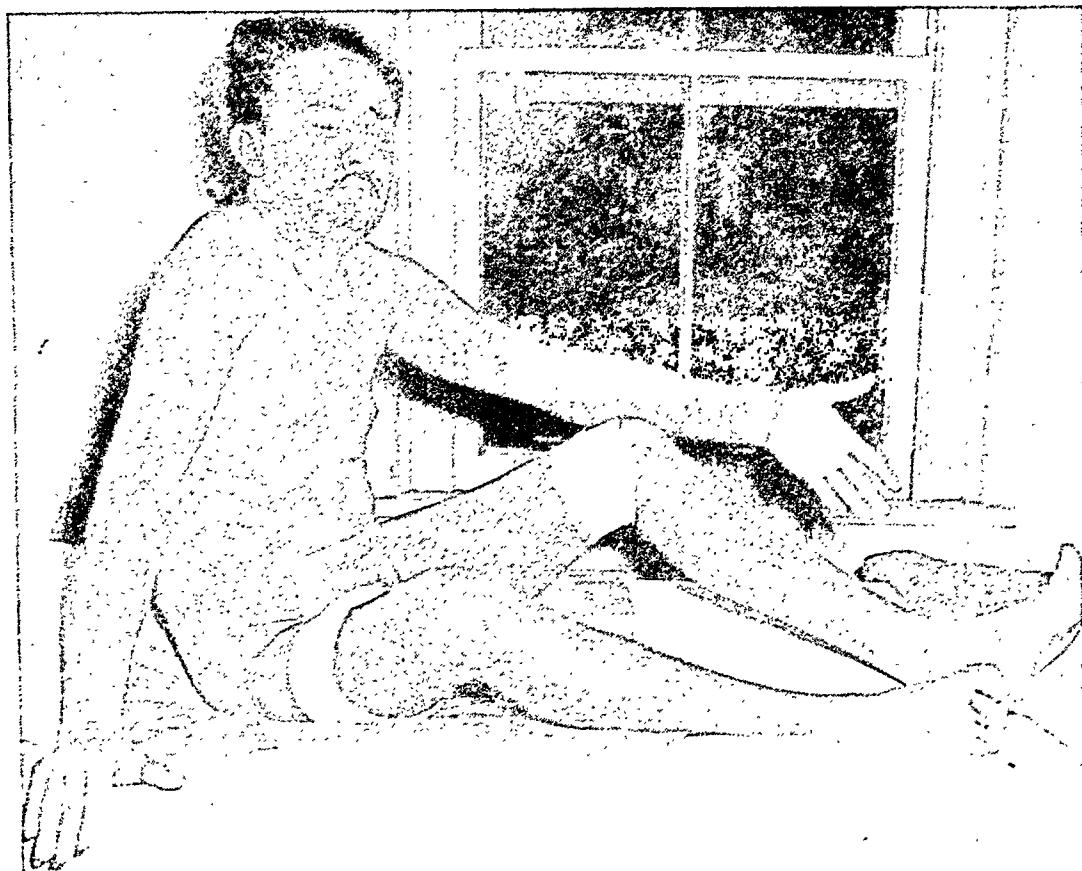
Three men, ages 43, 57, and 60, all patients at Bellevue Hospital when

Acosta was there, developed rashes on April 10, 11, and 13. A diagnosis of smallpox was made in each of these cases and the patients were removed to Willard Parker Hospital.

A 4 year old boy who was discharged from Willard Parker on March 10, the day of Le Bar's death, went to a convalescent home in Milbrook, N. Y. While there, he developed a rash which was subsequently diagnosed as smallpox. He was the source of 3 other cases at the home—a nun, age 62, a 5 year old boy, and a 2 year old girl. Thus the outbreak consisted of 12 cases, 9 originating in New York City and 3 in Milbrook, N. Y. Of the 9 in New York City, 2 died.

#### THE VACCINATION CAMPAIGN

The diagnosis of smallpox in the case of Acosta was confirmed by Dr. Smadel in a telephone call from Washington, D. C., on April 4, 1947. The U. S. Public Health Service was immediately notified and steps were taken by them to trace the route of the bus on which the Le Bars had traveled, in order to discover whether additional foci of infection had been set up. Mrs. Le Bar was located by the U. S. Public Health Service in Maine, where she had gone after her husband's death. Fortunately, she had been vaccinated against smallpox when she visited her husband at Willard Parker Hospital. She was in good health and had a successful vaccination. Follow-up along the bus route revealed that there were no cases of smallpox in those areas traceable to Le Bar. A plan for vaccinating all the people in the city was drafted by Health Department officials in conjunction with Commissioner of Hospitals Dr. Edward M. Bernecker and members of his staff. The Health Department's Bureau of Laboratories was placed on an emergency work schedule. A statement concerning the situation was given to the press, and messages were broadcast



I. A.—27 years old—smallpox on eighth day of the disease.



Infant 22 months old—smallpox on tenth day after onset.

over the radio urging all New Yorkers to be vaccinated without delay. Vaccination clinics in the Health Department headquarters building, in all Health Department health centers, and in the city hospitals were kept open day and night, seven days a week.

Two hundred and fifty thousand individual doses of smallpox vaccine were available for immediate distribution by the Health Department laboratories. Bulk for an additional 400,000 units was on hand. The Bureau of Laboratories began immediate packaging of the bulk, permission having been granted by the U. S. Public Health Service to put this vaccine up in vials containing fifty doses each. The United States Army and Navy sent several hundred thousand units of vaccine gathered from all parts of the country. Since millions of units were needed to vaccinate the people in New York City, and this amount was not available, Mayor O'Dwyer called an emergency meeting at his office. Present at this meeting were representatives of the manufacturers of vaccine, members of the Health Department staff, and Dr. Thomas M. Rivers, Director of the Rockefeller Institute for Medical Research, and member of the Board of Health. At the urgent request of the Mayor, the manufacturers went on a 24 hour schedule packaging their bulk vaccine and diverting all available supplies to this city. Retail pharmacists coöperated in distributing vaccine to private physicians. Vaccine supply stations were set up at a centrally located police precinct and at the Health Department.

Vaccination stations were set up in all police precincts, in addition to Health Department buildings and municipal hospitals and clinics. There was a total of 179 city installations being used for vaccination. Practically every hospital in the city set up a special clinic where vaccinations were given to all who applied, free of charge. The

vaccine was furnished by the Health Department and was administered by doctors on the hospital staff. Many community organizations set up local centers staffed by volunteer physicians and clerks. Labor and industry co-operated by establishing vaccination stations in factories, offices, and union headquarters. In some cases, their own physicians did the vaccinating; in others, it was performed by Health Department personnel. The stations maintained by the city remained open from 9 a.m. until 10 p.m., including Saturdays and Sundays. On April 26, those at the police precincts were discontinued, and on May 3 all other stations were closed.

In a period of less than a month more than 6,350,000 people were vaccinated in New York City, over 5,000,000 of them within the two week period following the appeal for universal vaccination made by the Mayor. Never before had so many people in one city been vaccinated in such a short time and on such short notice. Thanks are due to the press and radio for giving so generously of their space and time to bring necessary information to the public. Had it not been for them and for the intelligent coöperation of the public and the generosity of private physicians and volunteer workers, notably from the American Red Cross and the American Women's Voluntary Services and former Air Raid Warden groups, it would have been impossible to have achieved this remarkable record.

smallpox and 20 deaths. These cases were all attributable to a soldier stationed in Japan who had developed smallpox aboard ship en route to Seattle.

During the period 1900 to 1929, epidemics of virulent smallpox were reported throughout the United States. Notable among these were the outbreaks in 1921 in Denver and Kansas City, when the former city reported 924 cases and 37 deaths, and the latter 943 cases and 160 deaths. In 1924, Detroit reported 1,610 cases and 163 deaths. In 1901, an epidemic of smallpox in New York City resulted in 1,959 cases and 410 deaths. Had the same rate prevailed in the 1947 outbreak, there would have been 4,310 cases and 902 deaths.

All of the cases of smallpox that occurred in New York in April, 1947, were of the virulent type which usually has a fatality rate of 40 per cent in children and 20 per cent in adults. Because of the virulence of the disease and its high communicability, it is little short of remarkable that there were only 12 cases in the entire outbreak.

One of the most difficult problems facing health officials is the control of the spread of the disease through unrecognized mild cases in persons who have retained some immunity from vaccination in infancy. These mild missed cases can be the source of virulent smallpox in unvaccinated persons and in those who have completely lost their immunity from former vaccinations.

#### VACCINATION AND IMMUNITY

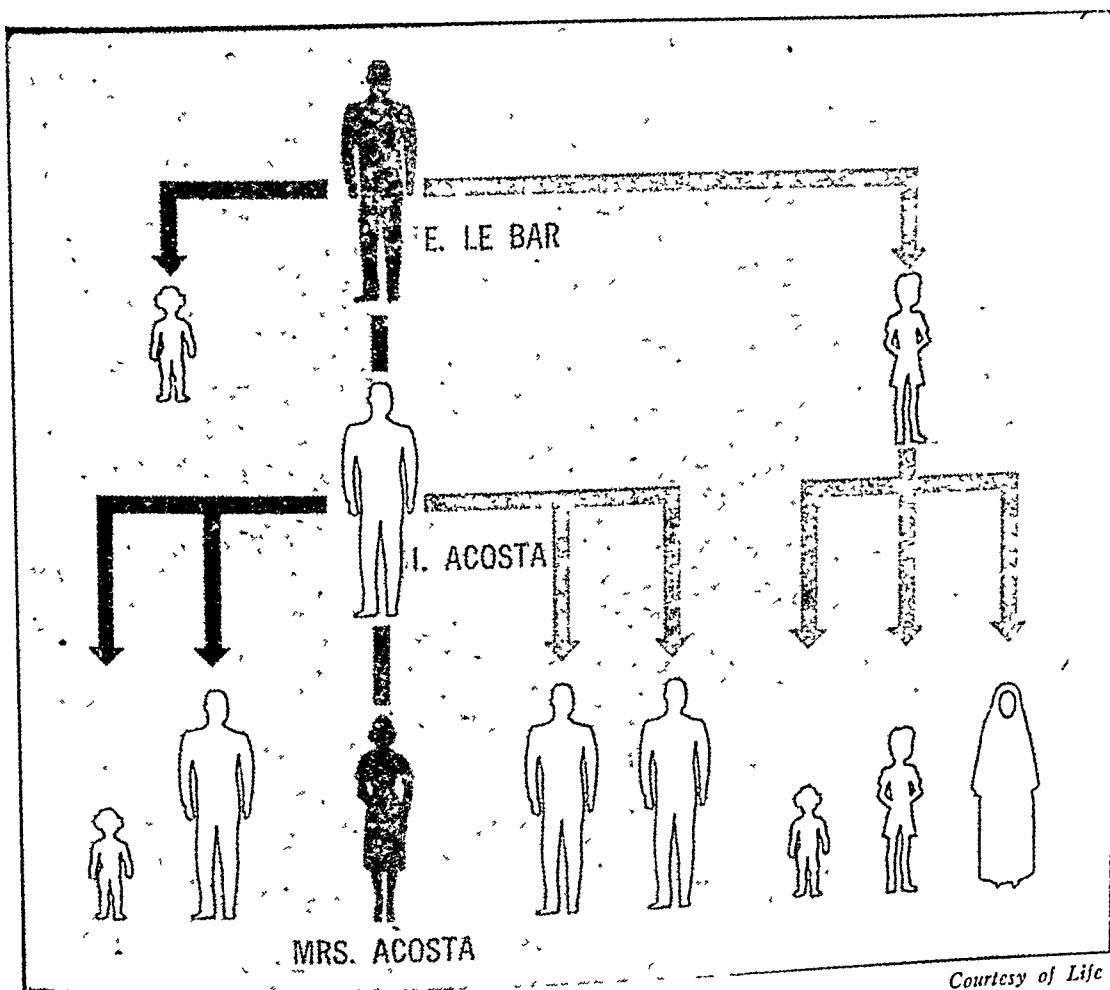
Of the 12 patients in the recent outbreak, only 3 had ever been vaccinated. These 3 had received protection more than forty years previously. There is no evidence that any person has a natural immunity to the disease. The length of time that immunity lasts in a vaccinated individual varies considerably. It may be just a few months or

many years. The soldier who brought smallpox to Seattle in 1945 was returning from the Pacific theatre of war and had been vaccinated as were all persons in the armed forces. Many individuals in New York City who had been vaccinated only a few years before the present outbreak had accelerated reactions when revaccinated, and in some cases, primary takes. Several physicians reported that children, 2, 3, and 4 years of age, who had been vaccinated in infancy, showed primary takes when revaccinated. It is therefore apparent that whenever a case of smallpox occurs in a community, the only safe procedure is for every person in that community to be vaccinated without delay. The vaccination procedure recommended and practised by the Health Department was the multiple pressure method.

#### SEQUELAE

Whenever a large-scale vaccination program is undertaken, there is always the possibility that there may be some unfortunate complications. Every health officer is aware of this, but also knows that it is a risk which must be taken if there is to be universal protection.

Rumors run riot during a vaccination campaign. Many persons with chickenpox or with simple skin eruptions are thought by their friends to have smallpox. The Health Department received innumerable telephone calls reporting cases of smallpox, which upon investigation proved to be chickenpox. Likewise, many people who, several days after they had been vaccinated, became ill with any one of a variety of symptoms, called the Health Department to find out if the vaccination was responsible. In New York City, there are thousands of people who become ill, and about two hundred of them die every day. Since practically every person in New York City had a recent vaccination, it was inevitable that some of them would become ill and would die. Vac-



*Courtesy of Life*

Disease spread from Eugene Le Bar to Ismael Acosta and two children. Acosta in turn infected his wife, who died, and four others. One child who was infected by Le Bar passed virus to two children and a nun in Millbrook, N. Y.

cination does not stop the normal course of events. Neither should vaccination be blamed for a death from cerebral hemorrhage, nephritis, or coronary occlusion.

It is well known that encephalitis occasionally follows vaccination. When it is due to vaccination, it almost invariably occurs 11 to 14 days later. It may occur up to 30 days later, but this is exceedingly rare. From the beginning of April, when the vaccination program was instituted, until the second week of June, 50 possible cases of encephalitis were reported to the Health Department. Four of these cases were ruled out as definitely not encephalitis. In the remaining 46 cases, the diagnosis was considered probable. Eight of these 46 individuals died.

A diagnosis of post-vaccinal encephalitis can be made with certainty only after microscopic examination of the brain tissue. Brain tissue of the 8 fatal cases was examined, and in none of them were the characteristic lesions of post-vaccinal encephalitis found. Autopsy showed that 2 of the deaths were caused by tuberculous meningitis, 1 by a brain tumor, 1 by coronary sclerosis, and 4 probably by cerebral lesions. The Health Department has had no proof of any death due to post-vaccinal encephalitis in its vaccination campaign.

Although none of the cases of encephalitis was found to be associated with vaccination, 3 deaths did occur from other complications. A 66 year old man died as a result of septicemia

which followed an infection of the vaccination. Two infants, age 8 months and 4 months, who had eczema, developed generalized vaccinia as a result of contact with persons who had been recently vaccinated.

Tragic as these incidents were, it must be borne in mind that had vaccination not been carried out on such a large scale, there very likely would have been thousands of cases and hundreds of deaths.

#### CONCLUSION

Every health officer must be aware that no community can be considered safe from smallpox even though there has not been a case of it for many

years. New York City had not had an outbreak for twenty years. Universal vaccination is the only safeguard. The period of immunity conferred by vaccination varies with each individual. Lasting protection can be assured only by periodic revaccination at intervals from five to ten years, always with a vaccine known to be potent and properly administered. Failure to react to a vaccination indicates an impotent vaccine or poor administrative technique. Contrary to popular belief, it does not indicate that the person is immune. Just as soon as a case of smallpox is suspected in a community, every effort must be made to have everyone vaccinated without delay.

# Control of Cross-Infections in Infants' Wards by the Use of Triethelyene Glycol Vapor\*

CLAYTON G. LOOSLI, M.D., MARGARET H. D. SMITH, M.D.,†  
ROSS L. GAULD, M.D., F.A.P.H.A.,‡ OSWALD H.  
ROBERTSON, M.D., AND THEODORE T. PUCK, Ph.D.

*Department of Medicine, the University of Chicago; Department of Pediatrics;  
and School of Hygiene and Public Health, Johns Hopkins University,  
Baltimore, Md.*

THE problem of prevention of cross-infections in infants' and children's wards is a serious one.<sup>1, 2</sup> Solution is made difficult by the lack of information concerning the relative importance of various means by which pathogenic organisms may be acquired. The air-borne route is recognized as one of the important modes of spread of etiological agents causing secondary respiratory tract, skin, and wound infections in hospitals. Four methods have been employed to keep the bacterial and virus content of the air in wards below the infective level. These are (a) increased ventilation and mechanical barriers,<sup>3, 4</sup> (b) dust suppression by the treatment of floors and bedclothes with oil,<sup>5-10</sup> (c) ultra-violet irradiation,<sup>1, 11-19</sup> and (d) chemical disinfection of air with glycol vapors.<sup>20-23, 26-31</sup> Several investigators have reported limited success in

reducing cross-infections in children's wards by means of irradiation of the air, but mechanical barriers, dust suppressive measures, and chemical disinfection with glycol vapors have not been evaluated in this respect.

In 1941 Robertson and associates first reported laboratory studies on the germicidal properties of propylene glycol when dispersed into the air as aerosols and vapors.<sup>20, 21</sup> Since this time, studies by various members of the Commission on Air-borne Infections under the direction of Robertson have been concerned with (a) further observations on the disinfecting properties of glycols, particularly of triethelyene glycol vapor,<sup>22, 32, 33</sup> (b) the mechanism of germicidal action of these compounds,<sup>23-25</sup> (c) the toxicity of glycols on repeated injection and on continuous inhalation by rats and monkeys,<sup>23, 34</sup> (d) the development of apparatus for the vaporization and control of the glycol vapor in the air,<sup>35-37</sup> (e) physico-chemical properties of glycol vapor in the atmosphere which influence the extent of its condensation on bacterial droplets,<sup>38-40</sup> and (f) the bactericidal activity of triethelyene glycol vapors in the atmospheres inhabited by human beings under different conditions of

\* Presented before the Epidemiology Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 13, 1946.

This investigation was supported by funds from the Commission on Air-borne Infections, Army Epidemiology Board, Office of the Surgeon General, Army United States, the Research Corporation, New York City, the Johns Hopkins University, and the University of Chicago.

† Now Research Fellow, Rockefeller Institute of Medical Research, Princeton, N. J.

‡ Now at Department of Virus and Rickettsial Diseases, Army Medical Center.



temperature, relative humidity, and dust control.<sup>26-28</sup>

Likewise, several reports by Bigg and coworkers since 1944 have dealt with the (a) development of apparatus for the dispersion of glycol vapors,<sup>41-43</sup> (b) the possible fire hazards connected with the use of glycols as germicidal agents,<sup>44</sup> (c) the lethal action of glycol vapors on spore-forming bacteria<sup>45</sup> and fungi,<sup>46</sup> and (d) the epidemiological observations on the use of triethylene glycol vapors as a means of controlling respiratory tract infections among military personnel.<sup>47, 48</sup> Other workers in this country,<sup>49-52</sup> Canada,<sup>53</sup> and England<sup>54</sup> have studied various aspects of the problem of the use of glycol vapors for the disinfection of air.

The present study was organized to evaluate further the use of triethylene glycol vapor as an air disinfecting agent for the prevention of cross-infections in hospital wards. Although previous studies by the Commission had demonstrated that the maximum effectiveness in ridding the atmosphere of bacteria is obtained when the action of glycol vapor is supplemented by dust control measures, it was decided to use only glycol vapor in this test, in order to assess the usefulness of this method alone. Because of the high incidence of cross-infections and the opportunity to control the activities of the patients, infants' wards were considered most suitable for conducting such an investigation. At the invitation of Dr. Edwards A. Park, the present study was made on the infants' wards of the Harriet Lane Home, Johns Hopkins Hospital. The investigation extended from November 15, 1945 to May 1, 1946.

#### MATERIALS AND METHODS

**Wards**—The test (east) and control (west) wards were comparable in size and shape (20 x 60 ft.). Each was divided into cubicles with walls extending from the floor to a height of

approximately 7 ft. (6 ft. 10 in.) Space was provided for 16 beds in the test and 18 in the control ward. The wards were heated by hot water and ventilated by opening windows. Figure 1 is a sketch of the test ward, showing, by numbers, the cubicles and the position of the apparatus employed in the maintenance and control of relative humidity and glycol vapor concentration in the air.

#### *Maintenance and Control of—*

**a. Relative Humidity and Temperature:** The apparatus employed was that developed and previously used by the Commission on Air-Borne Infections during studies on the control of the bacterial content of the air in Army hospital wards.<sup>26-28, 26, 37</sup> An instrument for recording continuously the wet and dry bulb temperatures\* was installed in both wards. Adequate humidification of the air of the wards was secured by introducing steam from the heating pipes after passage through a suitable muffler. A solenoid valve placed in the steam line and controlled by a Friez humidostat regulated the steam output to maintain a relative humidity of 40 per cent. One such humidifying system sufficed for the control ward, but two were needed for the test area in order to provide sufficient water vapor promptly in the vicinity of each glycol vaporizer. The temperature of the wards was controlled by opening the windows and manually turning radiators off and on.

**b. Concentration of glycol vapor in the air:** Two Research Corporation Glycol Vaporizers† were employed in the test ward, placed one on each side of the large utility room as shown in Figure 1. Appropriately placed fans mounted near the ceiling produced an even distribution of water and glycol vapors throughout each space. To avoid a direct draft on

\* Taylor Instrument Company, Chicago, Ill.

† A single vaporizer of this size would have been sufficient if the ward had not been constricted by the utility room.

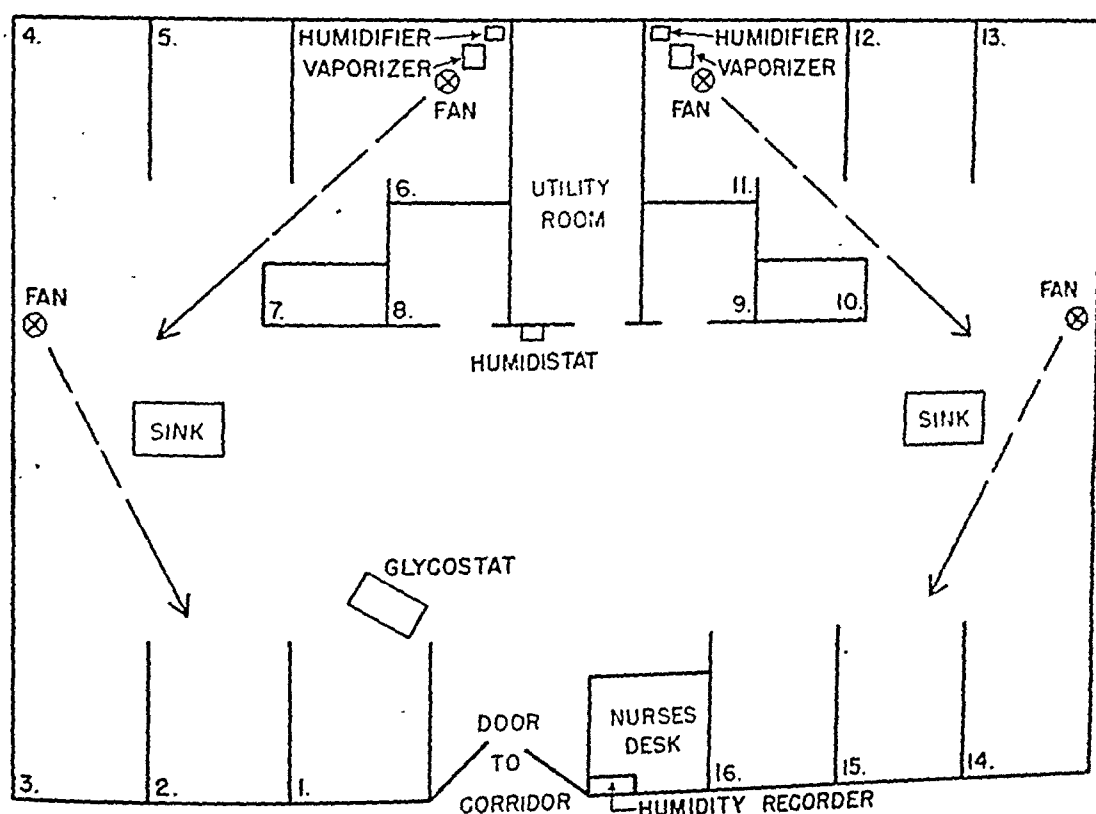


FIGURE 1—Test ward showing cubicle arrangement and position of apparatus for maintenance and control of relative humidity and glycol vapor concentration in the air

the infants, these fans\* were run at moderate speed and directed slightly upward. The direction of the air currents is shown by the arrows in Figure 1. The number of fans required for adequate mixture of the ward atmosphere was at least twice that needed for an unobstructed space. The output of the vaporizers was regulated by means of a glycostat which was placed in the room as shown in Figure 1. An Esterline-Angus milliammeter connected with the glycostat gave a continuous record of the concentration of triethylene glycol vapor in the air which was maintained below the fog level. The only occasions that a glycol fog occurred despite glycostat control were when the relative humidity was increased by the sudden release of large quantities of steam from the sterilizers in the ward utility room. Atmospheric supersaturation with glycol under these conditions was due to the fact that as the relative humidity in-

creases the amount of glycol vapor capable of being held in the air decreases progressively until finally condensation occurs.<sup>23-25</sup>

**Bacteriological Methods**—During the course of study, frequent surveys were made of the bacterial flora of the nasopharynges of the infants, noses and throats of the hospital personnel, and air and dust of the wards. Particular attention was paid to the presence of group and type-specific beta-hemolytic streptococci and type-specific pneumococci. Close attention was also directed toward the presence and spread of a previously undescribed respiratory tract pathogen of the Friedlander-aerogenes group, a Gram-negative bacillus, which "quelled" in types 23 and 32 pneumococcal typing sera.

**a. Patients:** Two nasopharyngeal cultures were obtained from each infant on admission and one, thereafter, on every Monday and Thursday, and one at the time of discharge. All patients devel-

\* Reynolds Fan Company, Chicago, Ill.

oping secondary infections of the respiratory tract, skin, and wounds were also cultured. The nasopharyngeal cultures were taken in the following manner: A small copper wire swab, moistened in fresh beef-heart infusion broth\* to which 2 per cent defibrinated sheep blood was added, was inserted first through one nostril and then the other nostril into the nasopharynx. It was allowed to remain there for 10 to 15 seconds, removed, smeared on a blood (5 per cent sheep) agar plate, and inserted again into the blood broth. The blood agar plate was streaked in the laboratory. Both broth and plate cultures were incubated for 18 hours at 37°C. The plates were examined for beta-hemolytic streptococci. If present, they were picked and transferred to tryptose phosphate broth for grouping and typing after the manner of Swift, Wilson, and Lancefield.<sup>55</sup>

All broth cultures were examined by direct typing for pneumococci and Gram-negative bacilli. Negative cultures were injected intraperitoneally into mice ( $\frac{1}{2}$  ml.) which, if they did not die, were killed in 48 to 72 hours and the peritoneal contents examined for the above organisms. Both broth and plate cultures were made from skin and wound lesions with the swab technique, after which they were examined in the above manner.

b. *Hospital personnel*: Nose and throat cultures were taken routinely once a week on the professional staff, nurses, and ward attendants. For several weeks, from January through March, nose and throat cultures were taken on visitors (parents, friends, etc.).<sup>†</sup> The cultures were then examined as described above

for pneumococci, hemolytic streptococci, and Gram-negative bacilli.

c. *Environment*: Semi-weekly bacteriological analyses of the air on the test and control wards were made employing the Folin-bubbler-sampler<sup>56</sup> and blood-agar open plate, methods previously used by the Commission on Air-borne Infection in other studies.<sup>26-28</sup> The samples were taken on the test and control wards on consecutive days (Monday and Tuesday, Thursday and Friday), usually from 7:30 a.m. to 9:30 a.m., during the period of maximum activity, such as bed making, bathing, and feeding of infants, and floor sweeping.

At the time of taking the air cultures, two Folin-bubbler-samplers were set up simultaneously, one at each end of the ward. Each sampler was run for 20 minutes, pulling air through it at the rate of 1 cu. ft. per minute. A total of from 10 to 12 such samples were taken during one morning's run. Aliquots of the bubbler broth were then plated for total bacteria (0.5 ml.) and for hemolytic streptococci (2.0 ml); 1-750,000 Gentian violet was added to the latter to inhibit the growth of other organisms.<sup>57</sup> Gentian violet was added to the remaining broth which was incubated for 18 hours at 27°C. and inoculated intraperitoneally into mice for isolation of pneumococci.

Open blood agar plates (without gentian violet) were placed on the bedside tables and exposed to the ward air for 1 hour (7:30 to 8:30 a.m.) and others containing gentian violet were exposed from 7:30 to 11:30 a.m. Counts for total bacteria as well as for hemolytic streptococci were made, and the latter picked for grouping and typing. Streptococci picked from the plates were inoculated into blood broth, and incubated at 37°C. for 18 hours, after which 0.5 ml. of the culture was inoculated intraperitoneally into mice for the isolation of pneumococci. The specific encapsulated Gram-negative bacillus referred to

\* Containing gentian violet 1-750,000. This concentration showed no germicidal effect on pneumococci, hemolytic streptococci, or the Gram-negative bacilli.

† Visitors were admitted to the ward only on the day of admission and once a week on Sundays from 2:00 to 3:00 P. M.

above grew also on the gentian violet plates as a mucoid translucent colony. These colonies were counted, picked, and set up directly in types 23 and 32 pneumococcal typing sera for identification.

#### *Ward Technique of Handling Patients*

—In so far as possible, an aseptic technique was followed when caring for the infants. Gowns, hung in the open ward at the entrance of each cubicle, were worn by the nurses and attendants when the infants were fed, dressed, changed, and had their beds made. Masks were also worn when very young infants were handled. Gowns were changed and hands washed thoroughly before and after caring for each patient. Attendants with upper respiratory infections were isolated during the acute phases of illness or required to wear masks while on the wards. In the case of emergencies and during ward rounds these techniques were not always carried out.

*Patients*—Infants from 1 day to 2 years of age were admitted to the wards with a wide variety of medical and surgical illnesses. There were 130 patients in the control and 140 in the test wards who stayed a sufficient length of time (5 days) to be included in the study. They were admitted, as far as possible, alternately to the test and control wards. In a few instances, some cases were shifted purposely from one ward to another. As shown in Table 1, the mean age of the patients and the time spent in the hospital were comparable on the two wards.

Approximately half of the patients had respiratory tract or skin infections at the time of admission. The results of the admission nasopharyngeal cultures are shown in Table 2. There were only 3 cases admitted to the wards with cultures positive for hemolytic streptococci. Actually, one of the cases on the test ward was a transfer from the control ward with the positive culture. The majority of the infants showed positive cultures for one or more types

TABLE 1

*Comparison of Experience of Patients with Respect to Age and Time Spent in Hospital*

Wards	Control	Test
Total admissions	130	140
Total hospital days	2,402	2,221
Mean number of days per patient	18.5	15.2
Mean (months) age on admission	7.6	7.3
Age (months) distribution of hospital days on ward		
25 per cent under	3.0	3.2
50 per cent under	7.0	6.1
75 per cent under	10.7	9.2
25 per cent over	10.7	9.2

TABLE 2

*Admissions with Respiratory or Skin Infections and Positive Nasopharyngeal Cultures for Pneumococci, H. Streptococci and Specific Gram-negative Bacillus*

Wards	Control	Test
Total Admissions	130	140
Admissions with Respiratory or Skin Infections	54	48
Nasopharyngeal Cultures		
Beta Hemolytic Streptococci (group A, types 2, 33)	1	2
Gram-negative Bacillus	2	1
Pneumococci (different strains)	67	96
Per cent most frequent		
*Pneumococcal Types (6, 14, 19, 23)	55	44
Per cent (24) additional types	45	56

of pneumococci. The most prevalent types, which made up approximately 50 per cent of the strains isolated, were 6, 14, 19, and 23. Twenty-four additional pneumococcal types were isolated (Table 2).

*Sulfonamide and Antibiotic Therapy*  
—Soon after the study began it became evident that consideration would have to be given to the use of sulfonamides and penicillin on the wards. These drugs, although of great benefit to the patient because of their antibacterial activity, constituted a factor which must be considered in the analysis of the findings if the experience of the two wards was to be compared. Accordingly, the experience of the patients in each of the two wards was divided into: (a) hospital days with no chemotherapy, and (b) hospital days with chemo-

therapy. This allowed not only a comparison of the effect of the triethylene glycol vapor, but also gave some measure of the role of these antibiotics in the prevention of new infections while on the wards.

An analysis of the experience of the two wards with respect to the use of antibiotics is shown in Table 3. It will be seen that 40 per cent of the experience of the patients on the control ward and 45 per cent of the experience on the test ward was with chemotherapy. This difference has been adjusted for in the analysis where the infection rates have been calculated per 1,000 hospital days, with and without chemotherapy (Table 5).

#### RESULTS

*Vaporization of Triethylene Glycol*—Vaporization of triethylene glycol was begun on the test ward November 7, 1945, and discontinued April 25, 1946. Observations on the incidence of secondary infections developing in the two wards were begun November 15, 1945, and continued until May 1, 1946. The concentration of glycol vapor in the air of the test ward varied from 55 per cent to 70 per cent.\* Only on one or two occasions was the glycol apparatus turned off for more than a few hours during the whole period of study. The longest interval (8 hours) occurred at night when a bulb in the glycostat burned out and was not replaced until the following morning. The consumption of triethylene glycol was approximately 200 ml. per day.

#### *Effect of Glycol on Personnel, Patients,*

\* Some trouble was encountered in the operation of the glycostat due to the marked dustiness of the ward air. It would gradually lose its sensitivity because of the accumulation of dirt on the reflecting surface of the rotating wheel. This made it necessary to reset the controls every two or three days to maintain the glycol concentration at the sub-fog level and to clean the glycostat about every ten days. On occasions, when the glycostat did not function well, it was set so that a visible fog was maintained to insure an adequate disinfecting concentration of glycol vapor in the air.

TABLE 3

*Comparison of Total Hospital Days of Patients to Days on Chemotherapy or Antibiotic Therapy*

Wards	Control	Test
Total number of patients	130	140
Total hospital days	2,402	2,221
Total days no Chemotherapy	1,442	1,236
Total days on Chemotherapy	960	985
Penicillin alone	491	572
Sulfonamides alone	281	264
Penicillin and Sulfonamides	165	149
Streptomycin	23	0

*and Ward Environment*—There were no major complaints from the attendants, nurses, or doctors who worked on the ward from a few days to several months. One or two nurses complained of headaches as a result of working on the ward when a visible glycol vapor fog was present. It was impossible to control the temperature adequately on the test ward and on occasions it would go as high as 85° F. with a R.H. of 40 per cent. At such times the ward was uncomfortably warm. There was no evidence of toxic effect on the respiratory tract or skin of infants who lived on the test ward from a few days to several weeks.

Due to the frequent release of large quantities of steam from the ward utility room, described earlier, glycol condensed on the windows and walls, which caused dirt to accumulate over a period of time. The condensation on walls and ceilings was greatly accentuated by the impingement of air currents from the four fans necessary to produce adequate mixing of the air in this constricted space. The unusually heavy dust content of the air added to the deposition of dirt. It should be pointed out in this connection that earlier installations of triethylene glycol in wards of similar size but having free circulation of air and a constant relative humidity were accompanied by no visible condensation of glycols on the walls or ceilings.<sup>26-28</sup>

*Bacterial Content of the Air*—The bacterial content of the air on the test and

TABLE 4

*Comparison of Environments of the Wards and the Bacterial Content of the Air*

Wards	Control	Test	Per cent Reduction
Number of days on which air samples were taken	43	43	..
Mean number of patients	14.7	13.8	..
Mean relative humidity	36.6	40.0	..
Mean per cent saturation of triethylene glycol	0.	60.0	..
Mean number settling plates exposed for 1 hour (8 to 9 a.m.)	11	11	..
Mean number bacteria per "settling plate"	149	103	31
Mean number cubic feet of air sampled (Folin-bubbler-sampler)	215	220	..
Mean number bacteria per cubic foot of air	90	26	70

TABLE 5

*Incidence of Infections Developing on Test and Control Wards in Relation to Chemotherapy*

	Control Ward			Test Ward Triethylene Glycol Vapor		
	Chemo- therapy	No Chemo- therapy	Total	Chemo- therapy	No Chemo- therapy	Total
Total Hospital Days →	960	1,442	2,402	985	1,236	2,221
A. Clinical infections:						
1. Nonspecific (URI) number	11	15	26	6	9	15
Rate per 1,000 hospital days	11.4	10.4	10.9	6.1	7.5	6.7
2. Specific bacterial number	2	18	20	2	9	11
Rate per 1,000 hospital days	2.1	12.4	8.3	2.0	7.5	4.9
B. Inapparent bacterial infections:						
Number	13	28	41	13	24	37
Rate per 1,000 hospital days	13.5	19.4	17.1	13.2	19.4	16.6

control wards was analyzed on 43 different days during the period of study. As shown in Table 4, the mean number of patients, mean relative humidity, number of settling plates exposed, and number of cubic feet of air analyzed by the Folin-bubbler-sampler were essentially the same on the test and control wards. The mean per cent saturation of triethylene glycol vapor on the test ward was 60 per cent during the days of air sampling.

There were 31 per cent less bacteria recovered from the air of the test ward employing settling plates, and 70 per cent less employing the Folin-bubbler-sampler, than were recovered by these techniques, from the air of the control ward. The variation in the number of air-borne bacteria obtained from the air of the wards during the period of study is shown in Figure 2. There was no apparent reduction in the number of group A type 33 hemolytic streptococci in the air when an infant with generalized

eczema, secondarily infected with these organisms, was placed on the glycol ward.<sup>58</sup> The extent of contamination of the environment by the "tracer" organisms will be given in separate reports.<sup>58, 63, 64</sup>

#### *Infections Developing on the Wards—*

All infections which developed in the infants on the two wards during the study period were classified as follows:

- Clinical infections:* These included all infections accompanied by two or more objective signs such as coryza, stuffy nose, red throat, red ear drums, draining ear, diarrhea, or vomiting; as well as those with symptoms of illness such as fever, fretfulness, or convulsions. Clinical infections were subdivided into non-specific and specific infections, depending upon whether or not it was possible to recover one of the three pathogens (pneumococci, hemolytic streptococci, or specific Gram-negative bacilli) from the nasopharynx, skin, or wound.
- Inapparent or non-clinical infections:*

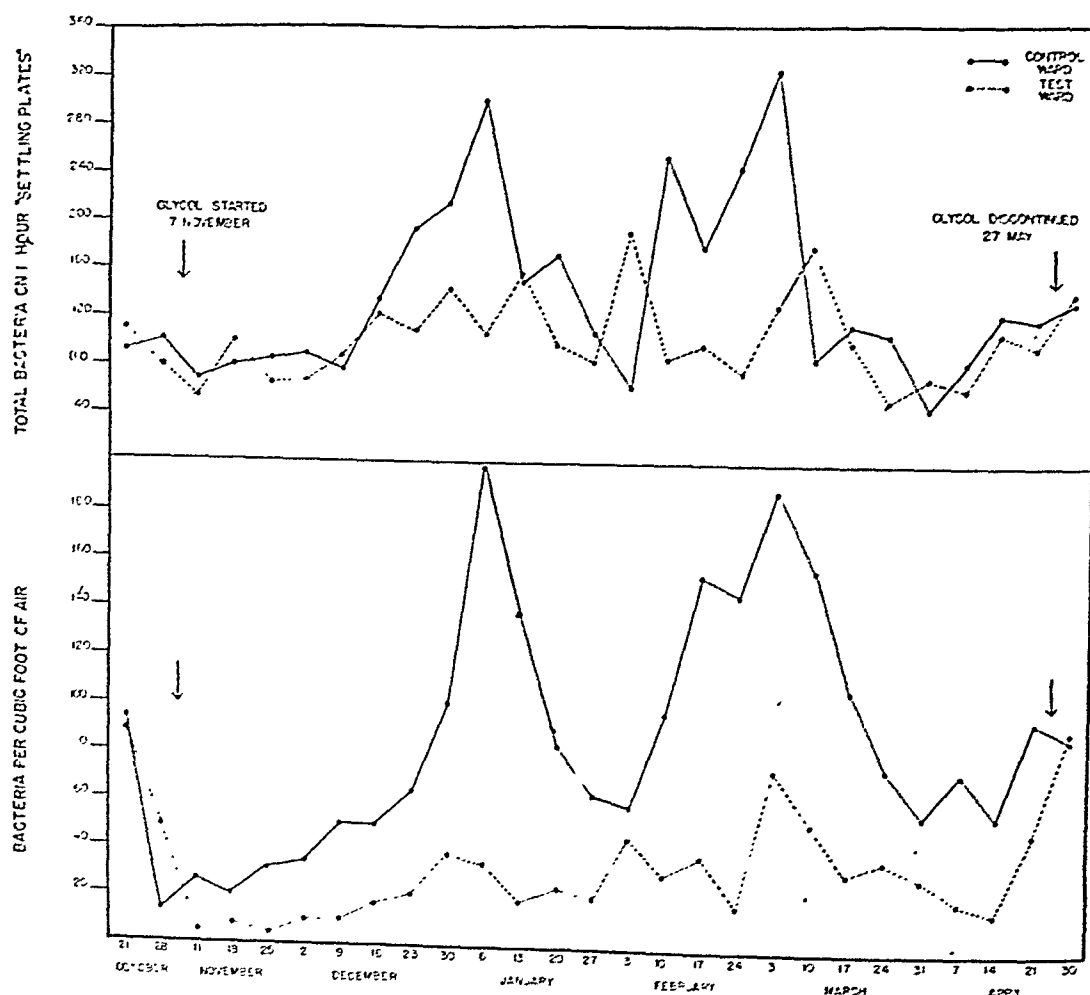


FIGURE 2—Weekly bacterial counts from the air of test and control wards employing blood agar open “settling plates” (above) and Folin-bubbler-samplers (below)

These included all cases where there were no clinical manifestations of illness, but a pneumococcus, hemolytic streptococcus, or specific Gram-negative bacillus not previously isolated from the case was cultured during the semiweekly swabbing of the nasopharynx.

Table 5 compares the incidence of infections developing on the two wards during the course of the study. A comparison of the rate per 1,000 hospital days for nonspecific clinical infections shows a slight margin in favor of the test ward. Thus, rates of 6.1 and 7.5 per 1,000 were recorded in the test ward for those receiving and not receiving chemotherapy respectively as against comparable rates of 11.4 and 10.4 on

the control ward. These differences, however, are no greater than could be expected to occur by chance. It is interesting to note that this type of infection was only slightly, if at all, influenced by chemotherapy.

Specific bacterial infections occurred at the same rate among those receiving chemotherapy on the two wards. Among those not on chemotherapy the rates were 12.4 and 7.5 for the control and test wards respectively. This difference is well within the range of chance variation and no conclusions as to the efficacy of triethylene glycol vapor in preventing this type of infection is warranted on the basis of these results. It should be noted, however, that with bacterial in-

TABLE 6

*Comparison of Nonspecific and Specific Bacterial Cross-infections*

<i>Wards</i>	<i>Control</i>	<i>Test</i>
I. Clinical Infections:		
A. Nonspecific (URI) Infections (total)	26	15
B. Specific Bacterial Infections:		
1. Otitis media (unspecified)	1	2
2. Otitis media (hemolytic strept. type 33)	1	1
3. Upper respiratory infections due to:		
Pneumococci (type specific)	7	2
Hemolytic Streptococci, group A, type 33.	2	2
Specific Gram-negative Bacilli	4	1
4. Meningitis (pneumococcus type 25)	1	0
5. Skin (hemolytic streptococcus type 33)	3	1
6. Wound (hemolytic streptococcus type 33)	1	0
7. Bronchopneumonia (organism unidentified)	0	2
Total	20	11
II. Inapparent Infections due to:		
A. Hemolytic Streptococcus (type 33)	6	2
B. Pneumococcus (15 different types)	20	17
C. Specific Gram-negative Bacillus	15	18
Total	41	37

fections the incidence was significantly lower on both wards among those receiving antibiotics.

No differences were observed in the incidence of the inapparent infections on the two wards, nor was there any significant reduction in the occurrence of these infections due to administration of chemotherapy.

In Table 6 are listed the number and kinds of infections occurring on the test and control wards from which the data given in Table 5 are derived.

## DISCUSSION

The apparatus employed in dispersing and controlling the concentration of glycol in the air of the test ward functioned satisfactorily during the period of study. This is shown by the fact that 70 per cent less bacteria, using the Folin-bubbler-sampler, were recovered from the air of the test ward than from that of the control ward. This reduction is essentially the same as that (60 per cent) reported by Hamburger, Puck, and Robertson<sup>26-28</sup> in the streptococcal content of the air, when similar apparatus was employed in hospital wards in Army camps. Combining dust suppres-

sive measures with glycol vapors for the disinfection of air, they reduced the streptococcal count in the air of the test ward over 90 per cent, compared to counts attained during the control periods. No data are available as to the degree of reduction of air-borne pathogenic bacteria necessary to bring about a lowered incidence of infection.

In the present study, dust suppressive measures (oil to bedclothes and floors<sup>9, 10</sup>) were not employed. This is reflected in the lack of any striking effect of the glycol vapor on the bacterial content of the air as shown by the open plate counts. On the basis of the probable mechanism of germicidal action of glycol vapors,<sup>23-25</sup> it would not be expected that the bacteria in the larger particles which quickly "settle out" of the air onto the exposed blood-agar plates would be killed by the germicidal vapors. Thus, as pointed out by these investigators, oiling procedures should be employed along with the glycol vapors for the latter to function most satisfactorily.<sup>26, 27</sup>

Bigg and associates<sup>47, 48</sup> have applied the technique of chemical disinfection of air with glycol vapors to the problem



of control of respiratory diseases among military personnel. They compared the incidence of infections in a group of men (324) sleeping in glycol-treated quarters over a 6 week period, with the incidence among a control group sleeping in untreated quarters. Although there were 64 per cent less infections among the men billeted in the glycol-treated quarters during the last 3 weeks of observation, the reduction for the entire period was only 12 per cent. The number of carriers for hemolytic streptococci also became less in the group living in the glycolized quarters.

Harris and Stokes<sup>29-31</sup> observed the effect of propylene glycol vapor and, later, triethylene glycol vapor on the incidence of respiratory infection in a children's convalescent home. During the three year study they observed only 13 infections on the wards during the test periods, compared to 132 during the control periods. As pointed out by the authors, this study was made under highly favorable circumstances. The wards were essentially quiet ones with a limited amount of coming and going of visitors, professional and nursing staff. Very few of the children were acutely ill. Most of them were bedfast, providing very little contact with one another and opportunity for direct drop-let spread of infection.

Our study in the infants' wards at the Harriet Lane Home shows no such dramatic results as those reported by Harris and Stokes. However, the conditions for testing triethylene glycol vapors as a means of control of cross-infections were not so favorable. Harriet Lane Home is a teaching hospital for medical students, nurses, a large group of house staff and attending men, and there was continuous traffic by the personnel into and out of the wards for the greater part of the day. Many of the infants were acutely ill and often required intimate care by the attendant, nurse, or doctor. During emergencies,

cubicle isolation and aseptic techniques were sometimes broken. This situation existed equally on both the test and control wards. Thus, the conditions under which this study was conducted constituted an unusually difficult test for evaluating the use of glycol vapors for the prevention of hospital infections. Although the incidence of nonspecific and specific bacterial cross-infections was less among the infants on the glycol ward than among those on the control ward, the difference is not statistically significant. As indicated above, there were many opportunities for the spread of infections other than by the air-borne route. Recognizing this, the reduction in clinical infections which did occur on the test ward may represent that proportion which were air-borne and thus prevented by glycol vapor.

The question was often asked by interested visitors during the course of this study, how triethylene glycol vapor compares with ultra-violet irradiation as a means of preventing cross-infections in children's hospitals. Ultra-violet light has been employed for this purpose by McKhann, Steeger, and Long,<sup>1</sup> Barenberg, Greene, and Greenspan,<sup>11</sup> Greene, Barenberg, and Greenberg,<sup>12</sup> del Mundo and McKhann,<sup>13</sup> Sauer, Minsk, and Rosenstern,<sup>15, 16</sup> and Robertson, Doyle, and Tisdall<sup>19</sup> with varying degrees of success. Brooks, Wilson, and Blackfan,<sup>14</sup> on the other hand, report no effect of ultra-violet light in preventing respiratory infections on infants' wards. On the basis of the results of the above studies already cited and those of Wells,<sup>59</sup> Hart,<sup>60</sup> and others, the Council on Physical Therapy voted to accept ultra-violet lamps for disinfecting purposes.<sup>61</sup> Hollaender,<sup>62</sup> reviewing the problem of ultra-violet irradiation, emphasized that further studies following carefully the recommendations of the Council were necessary before this technique of air disinfection could be evaluated accurately. The results of

chemical disinfection of air with glycol vapors are encouraging but many more controlled studies under different ward conditions need be carried out before the relative merits of ultra-violet light and glycol vapors for air disinfection can be evaluated.

Although the extensive use of sulfonamides and penicillin was considered a complication as far as the primary purpose of this study was concerned, it was recognized that the administration of these therapeutic agents was now a general procedure and that they would be widely employed in any future ward study of this kind. The significantly low incidence of clinical, bacterial infections in the groups receiving antibiotics, compared to the rate among those not receiving drugs on both wards, shows that these antibacterial agents also acted prophylactically to prevent the pathogens from invading the host tissues, although they did not prevent implantation on the mucous membranes. Essentially no controlling effect by these drugs, however, was observed in the case of nonspecific clinical and inapparent bacterial infections. These observations emphasize that air disinfecting procedures as a means of preventing secondary bacterial infections must also be evaluated in relation to the simple, but sometimes expensive, therapeutic procedure of giving antibiotics for the duration of the child's stay in the hospital.

Space will permit but a brief statement of the epidemiological studies to determine the relative importance of different modes of spread of infections on the wards. Employing the hemolytic streptococcus, pneumococcus, and specific Gram-negative bacillus as "tracer" organisms, it was found that at certain times the ward environment (dust and air) became heavily contaminated with these pathogens. The source was usually found to be one or more of the ward patients with exudative skin infections or purulent otitis media in the case of

the hemolytic streptococcus, a chronic sinusitis or bronchitis with considerable nasal discharge and coughing in the case of the pneumococcus, and acute upper respiratory infections and diarrhea in cases where the Gram-negative bacillus was isolated from the throats and stools. Thus, the path of infections appeared to lead from patient to patient and from patient to attendant, nurse, visitor, and doctor. In rare instances was the course of the infection traceable to an adult. The data from which these observations were made will be the subject of separate reports.<sup>58, 63, 64</sup>

#### SUMMARY AND CONCLUSIONS

A study was conducted on the control of cross-infections by the use of triethylene glycol vapor on the infants' wards of the Harriet Lane Home, Johns Hopkins Hospital, from October 15, 1945, to May 1, 1946. The test and control wards were comparable in size, physical set-up, number of patients, and kinds of primary diseases treated.

The apparatus employed was that used in previous studies by the Commission on Air-borne Infections, Army Epidemiological Board, for the disinfection of air with glycol vapors in hospital wards in army camps. Under the conditions of the ward environments at the Harriet Lane Home, the dispersal and control of the glycol vapor was satisfactory. The extreme dustiness of the ward air (in the absence of the use of dust suppressive measures) necessitated frequent cleaning of the glycolstat to insure its proper functioning. During the period of study, the concentration of glycol vapor in the air of the test ward varied from 55 to 70 per cent.

There were no complaints from the attendants, nurses, or doctors who worked on the glycol wards. No injurious effect was noted on the respiratory tract or skin of infants who were on the test ward for several weeks to months.

Employing settling plates and the

Folin-bubbler-sampler, there was a consistent and significant reduction (31 and 70 per cent respectively) in the number of bacteria isolated from the air of the glycol ward when compared to the numbers isolated from the air of the control ward.

On account of the general use of chemotherapy, both for prophylaxis and treatment, it was necessary to consider this factor in the analysis of the data. A comparison of the rate of nonspecific clinical infections (URI) per 1,000 hospital days showed a slight margin in favor of the test ward. The difference, however, was no greater than could be expected by chance. These infections were only slightly, if at all, influenced by chemotherapy.

The rates per 1,000 hospital days of specific bacterial infections among those not receiving chemotherapy were 12.4 and 7.5 for the control and test wards respectively. This difference is within the range of chance variation, and no conclusions as to the efficacy of triethylene glycol in preventing this type of infection is warranted on the basis of these results.

Specific bacterial infections occurred at the same rate among those receiving chemotherapy on the two wards and was significantly lower on both wards than among those not receiving antibiotics.

Many more similarly controlled studies under different conditions of ward environments need be done to evaluate further the use of glycol vapor as a practical means of preventing cross-infections in hospitals and to compare its relative effectiveness with other methods of air disinfection (ultra-violet light and dust suppressive measures) and the prophylactic use of chemotherapeutic agents.

**ACKNOWLEDGMENT**—The authors wish to express their appreciation for the wholehearted cooperation of Dr. Edwards A. Park, Professor of Pediatrics and Pediatrician-in-Chief of the

Johns Hopkins Hospital; Dr. Alan M. Chesney, Dean of the School of Medicine, Johns Hopkins University; Dr. Edwin L. Crosby, Director of the Johns Hopkins Hospital; Helen Schnetzer, Head of Pediatric Nursing, Harriet Lane Home; Drs. Alexander J. Schaffer and Horace L. Hodes, Associates in Pediatrics and Attending Physicians at the Harriet Lane Home, the House Staff, and the Assistant Supervisors of Nursing at the Harriet Lane Home.

The authors also take pleasure in acknowledging the assistance on the wards of Nurses T. Aufhauser and D. H. Sinclair, and in the laboratory of J. Cline, C. M. Gonyea, I. Krimminger, L. V. Nelson, M. H. Ritter, and R. Kley.

#### REFERENCES

1. McKhann, C. F., Steeger, A., and Long, A. P. Hospital Infections. I. A Survey of the Problem. *Am. J. Dis. Child.*, 55:579-599, 1938.
2. Cruickshank, R. Hospital Infection, A Historical Review. *Brit. M. J.*, 2:272-276, 1944.
3. Reyniers, James A. The Control of Cross-contamination by the Use of Mechanical Barriers. I. Principles and Instrumentation for Absolute and Partial Control with Fixed and Circulating Hosts. *Aerobiology Assoc. Adv. Sc. No. 17*, 254-259, 1942.
4. Reyniers, James A. The Control of Cross-contamination by the Use of Mechanical Barriers. II. Testing the Efficiency of Mechanical Systems for Controlling Cross-infections. *Aerobiology Assoc. Adv. Sc. No. 17*, 260-266, 1942.
5. van den Ende, M., Lush O., and Edward, D. G. II. Reduction of Dust-borne Bacteria by Treating Floors. *Lancet*, 2:133-134, 1940.
6. van den Ende, M., and Thomas, I. C. Treatment of Bedclothes with Dust-laying Aids, Use of Oil-in-water Emulsions. *Lancet*, 2:755-759, 1941.
7. Robertson, O. H., Hamburger, M. J., Loosli, C. G., Puck, T. T., Lemon, H. M., and Wise, H. A. Study of the Nature and Control of Air-borne Infection in Army Camps. *J.A.M.A.*, 126:993-999, 1944.
8. Wright, J., Cruickshank, R., and Gunn, W. Control of Dust-borne Streptococcal Infection in Measles Wards. *Brit. M. J.*, 1:611-614, 1944.
9. Loosli, C. G., and Robertson, O. H. Recent Studies on the Control of Dust-borne Bacteria by Treatment of Floors and Bedclothes with Oil. *Am. J. M. Sc.*, 209:166-172, 1945.
10. Loosli, C. G., Wise, H., Lemon, H. M., Puck, T. T., and Robertson, O. H. The Oil Treatment of Bedclothes for the Control of Dust-borne Infection. II. The Use of Triton Oil Emulsion T-13 as a Routine Laundry Procedure. *Am. J. Hyg.*, 43:105-119, 1946.
11. Barenberg, L. H., Greene, D., and Greenspan, L. Effect of Irradiation of the Air in a Ward on the Incidence of Infections of the Respiratory Tract. *Am. J. Dis. Child.*, 59:1219-1226, 1940.
12. Greene, D., Barenberg, L. H., and Greenberg, B. Effect of Irradiation of the Air in a Ward on the Incidence of Infections of the Respiratory Tract with Note on Varicella (Chicken pox). *Am. J. Dis. Child.*, 61:273-275, 1941.
13. del Mundo, F., and McKhann, C. F. Effect of Ultraviolet Irradiation of Air on Incidence of Infections in an Infants' Hospital. *Am. J. Dis. Child.*, 61:213-230, 1941.

14. Brooks, G. L., Wilson, U., and Blackfen, K. D. Studies of Cross-infection in Infants' Hospital in Boston. *Aerobiology Am. Assoc. Adv. Sc. No. 7*, 228-236, 1942.
15. Rosenstern, I. Observations on the Control of Respiratory Contagion in the Cradle. *Aerobiology Am. Assoc. Adv. Sc. No. 17*, 242-250, 1942.
16. Sauer, L. W., Minsk, L. D., and Rosenstern, I. Control of Cross Infections of the Respiratory Tract. *J.A.M.A.*, 118:1271-1274, 1942.
17. Sommer, H. E., and Stokes, Joseph, Jr. Studies on Air-borne Infection in a Hospital Ward: I. The Effect of Ultraviolet Light on Cross Infection in an Infants' Ward. *J. Pediat.*, 21:569-576, 1942.
18. Henle, W., Sommer, H. E., and Stokes, J., Jr. Studies on Air-borne Infection in a Hospital Ward: II. Effects of Ultraviolet Irradiation and Propylene Glycol Vaporization on the Prevention of Experimental Air-borne Infection of Mice by Droplet Nuclei. *J. Pediat.*, 21:577-590, 1942.
19. Robertson, E. C., Doyle, M. E., and Tisdall, F. F. Use of Ultraviolet Radiation in Reduction of Respiratory Cross Infections in a Children's Hospital: Final Report. *J.A.M.A.*, 121:908-914, 1943.
20. Robertson, O. H., Bigg, E., Miller, B. F., and Baker, Z. Sterilization of Air by Certain Glycols Employed as Aerosols. *Science*, 93:213-214, 1941.
21. Robertson, O. H., Loosli, C. G., Puck, T. T., Bigg, E., and Miller, B. F. The Protection of Mice against Infection with Air-borne Influenza Virus by Means of Propylene Glycol Vapor. *Science*, 94:612-613, 1941.
22. Robertson, O. H., Puck, T. T., Lemon, H. M., and Loosli, C. G. The Lethal Effect of Triethylene Glycol on Air-borne Bacteria and Influenza Virus. *Science*, 97:142-144, 1943.
23. Robertson, O. H. *Sterilization of Air with Glycol Vapors*. Harvey Lecture Series, 38:227-234, 1942-43.
24. Puck, T. T. The Mechanism of Aerial Disinfection by Glycols and Other Chemical Agents. I. Demonstration that the Germicidal Action Occurs through the Agency of the Vapor Phase. *J. Exper. Med.*, 85:729-739, 1947.
25. Puck, T. T. The Mechanism of Aerial Disinfection by Glycols and Other Chemical Agents. II. An Analysis of the Factors Governing the Efficiency of Chemical Disinfection of the Air. *J. Exper. Med.*, 85:741-757, 1947.
26. Hamburger, M., Puck, T. T., and Robertson, O. H. The Effect of Triethylene Glycol Vapor on Air-borne Beta Hemolytic Streptococci in Hospital Wards. I. *J. Infect. Dis.*, 76:208-215, 1945.
27. Puck, T. T., Hamburger, M., Robertson, O. H., and Hurst, V. The Effect of Triethylene Glycol Vapor on Air-borne Beta Hemolytic Streptococci in Hospital Wards. II. The Combined Action of Glycol Vapor and Dust Control Measures. *J. Infect. Dis.*, 76:216-225, 1945.
28. Hamburger, M., Hurst, V., Robertson, O. H., and Puck, T. T. The Effect of Triethylene Glycol Vapor on Air-borne Beta Hemolytic Streptococci in Hospital Wards. III. The Action of Glycol Vapors at Low Relative Humidities. *J. Infect. Dis.*, 77:177-180, 1945.
29. Harris, T. N., and Stokes, J. Jr., The Effect of Propylene Glycol Vapor on the Incidence of Respiratory Infections in a Convalescent Home for Children. *Am. J. M. Sc.*, 204:430-436, 1942.
30. Harris, T. N., and Stokes, J. Jr., Air-borne Cross Infection in the Case of the Common Cold. A Further Clinical Study of the Use of Glycol Vapors for Air Sterilization. *Am. J. M. Sc.*, 206:631-636, 1943.
31. Harris, T. N., and Stoker, I. Summary of a 3-year Study of the Clinical Application of the Disinfection of Air by Glycol Vapors. *Am. J. M. Sc.*, 209:152-156, 1945.
32. Robertson, O. H., Bigg, E., Puck, T. T., and Miller, B. F. The Bactericidal Action of Propylene Glycol Vapor on Microorganisms Suspended in Air. I. *J. Exper. Med.*, 75:593-610, 1942.
33. Puck, T. T., Robertson, O. H., and Lemon, H. M. Bactericidal Action of Propylene Glycol Vapor on Microorganisms Suspended in Air. II. *J. Exper. Med.*, 78:387-406, 1943.
34. Robertson, O. H., Loosli, C. G., Puck, T. T., Lemon, H. M., and Wise, H. Test for the Toxicity of Propylene Glycol and Triethylene Glycol on Monkeys and Rats by Inhalation of Vapor and Oral Injection. *J. Pharmacol. & Exper. Therap.*, Sept., 1947.
35. Wise, H., Puck, T. T., and Stral, H. M. A Rapid Colorimetric Method for the Determination of Glycols in Air. *J. Biol. Chem.*, 150:61-67, 1943.
36. Puck, T. T., Wise, H., and Robertson, O. H. A Device for Automatically Controlling the Concentration of Glycol Vapors in the Air. *J. Exper. Med.*, 80:377-381, 1944.
37. Puck, T. T., and Chaney, A. L. The Dispersal and Control of Triethylene Glycol Vapor for Aerial Disinfection. *Indust. Hyg. Quart.*, 7:3-10, 1946.
38. Puck, T. T., and Wise, W. Studies on Vapor Liquid Equilibria. I. A New Dynamic Method for the Determination of Vapor Pressure of Liquids. *J. Phys. Chem.*, 50:329-339, 1946.
39. Wise, H., and Puck, T. T. The Saturation Concentrations of Triethylene Glycol Vapor at Various Relative Humidities and Temperatures. *Science*, 105:556-557, 1947.
40. Wise, H., Failey, C. F., and Puck, T. T. III. Studies on Vapor Liquid Equilibria. To be published.
41. Bigg, E., and Jennings, D. H. The Introduction of Glycol Vapors for Air Sterilization by a New Vaporization Method. *J. Indust. Hyg. & Toxicol.*, 26:307-312, 1944.
42. Olson, F. C. W., Bigg, E., and Jennings, B. H. Portable Glycol Vaporizers for Air Sterilization. *Science*, 105:23-24, 1947.
43. Bigg, E., Jennings, B. H., and Fried, S. The Use of Glycol Vapors for Bacterial Control in Large Spaces. *Am. J. M. Sc.*, 207:361-369, 1944.
44. Bigg, E., Jennings, B. H., and Fried, S. The Inflammability Characteristics of Propylene and Triethylene Glycol in Liquid and Vapor Form. *Am. J. M. Sc.*, 207:370-374, 1944.
45. Bigg, E. Effect of Propylene Glycol on Bacterial Spores. *Proc. Exper. Soc. Biol. & Med.*, 53:120-121, 1943.
46. Bigg, E., and Melody, M. Fungicidal Action of Triethylene Glycol. *J. Infect. Dis.*, 79:45-56, 1946.
47. Bigg, E., Olson, F. C. W., and Jennings, B. H. Observations on the Use of Triethylene Glycol Vapors in Military Barracks. *Proc. Central Society for Clinical Research*, 17:38, 1944.
48. Bigg, E., Jennings, B. H., and Olson, F. C. W. Epidemiologic Observations on the Use of Glycol Vapors for Air Sterilization. *A.J.P.H.*, 35:788-798, 1945.
49. Henle, W., and Zellat, J. Effect of Propylene Glycol Aerosol on Air-borne Virus of Influenza A. *Proc. Soc. Exper. Biol. & Med.*, 48:544-547, 1941.
50. Personnel Navy Medical Research Unit No. 1. Laboratory and Field Studies of Glycols and Floor Oiling in the Control of Airborne Bacteria. *U. S. Nav. M. Bull.*, 52:1288-1307, 1944.
51. De Ome, K. B. The Effect of Temperature, Humidity and Glycol Vapor on the Visibility of Air-borne Bacteria. *Am. J. Hyg.*, 40:239-250, 1944.
52. Personnel of Navy Medical Research Unit No. 1. A Simplified Propylene Glycol Dispenser for Field Use. *Science*, 97:208, 1943.
53. Mather, J. M., and McClure, A. D. Experiences with the Use of Propylene Glycol as a Bactericidal

Aerosol in a R.C.A.F. Barracks. *Canad. Pub. Health J.*, 36:181-187, 1945.

54. Challinor, S. W., and Duguid. Propylene Glycol Vapour as an Air Disinfectant. I. *Edinburgh M. J.*, 51:280, 1944.

55. Swift, H. F., Wilson, A. T., and Lancetfield, R. C. Typing Group A Hemolytic Streptococci by Precipitous Reactions in Capillary Pipettes. *J. Exper. Med.*, 78:127-133, 1943.

56. Lemon, H. M. A Method for Collection of Bacteria from Air and Textiles. *Proc. Soc. Exper. Biol. & Med.*, 54:298-301, 1943.

57. Garrod, L. P. Monograph, *St. Bartholomews Hosp. Reports*, 66:203-252, 1933.

58. Loosli, C. G., Smith, M., Cline, H. D., and Nelson, L. The Transmission of Hemolytic Streptococcal Infections in Infants' Wards. II. To be published.

59. Wells, W. F. Air Disinfection in Day Schools. *A.J.P.H.*, 33:1436-1443, 1943.

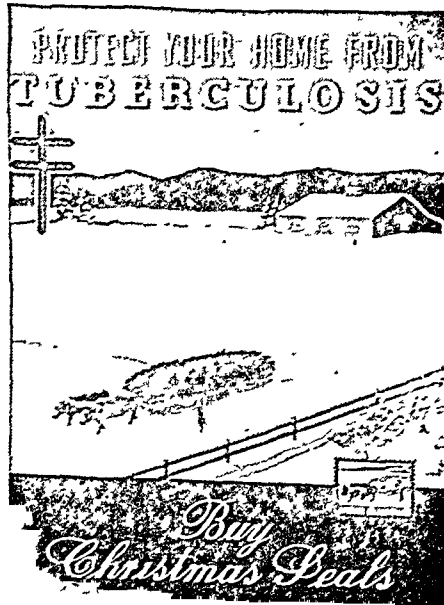
60. Hart, D., Devine, J. W., and Martin, O. W. Bactericidal and Fungicidal Effect of Ultraviolet Radiation. *Arch. Surg.*, 38:806-815, 1939.

61. Council on Physical Therapy: Acceptance of Ultraviolet Lamps for Disinfecting Purposes. *J.A.M.A.*, 122:503-504, 1943.

62. Hollaender, A. Disinfection of Air by Ultraviolet Irradiation. *A.J.P.H.*, 34:887, 1944.

63. Loosli, C. G., Smith, M. H. D., Ritter, G., and Nelson, L. Transmission of Pneumococcal Infections on Infants' Wards. III. To be published.

64. Smith, M. H. D., Loosli, C. G. and Ritter, G. Transmission of Infections due to a Specific Gram Negative Bacillus on Infants Wards. IV. To be published.



# Opportunities for the Engineer in Public Health\*

ROBERT N. CLARK, F.A.P.H.A.

*Chief Public Health Engineer, Tennessee Valley Authority, Chattanooga, Tenn.*

THE opportunities for the engineer in the field of public health rest upon the need for the sort of service he can do, the analysis of problems, the research, the ingenuity in devising solution, the techniques of applying engineering equipment and methods, all with due regard to good economy and good organization. However, the opportunities for the engineer depend as much, or more, upon his personal characteristics, his imagination, his initiative, his energy, his intelligence, and his attitudes. It is up to him to develop his opportunities, not only as they knock on his door, but as he seeks them out. In the field of public health, the most effective development of an opportunity rests mainly on one personal attribute, a common ingredient in all successful public health workers, whether engineers, epidemiologists, nurses, or others, and that is a public health consciousness.

Not everyone has this attribute. Many public health workers become so immersed in a limited phase of a problem, so intrigued with complications or challenges to their technical ability, that they incline to overlook simple and elementary measures that have an important bearing on public health. Physicians are apt to think in terms of cases, engineers in terms of specialized equipment, and they both may lose

sight of a dominant element of their work. Recently, Dr. Haskell, in commenting on factors leading to unsatisfactory results of a milk sanitation program, stressed the need for just plain cleanliness. He stated that although modern milk sanitarians could discourse learnedly on the application of electronics to milk pasteurization, he doubted if more than a small percentage of them could take a milking machine apart and put it together again, and that an even smaller percentage carried with them a rod to probe the tubing. This has a familiar sound. How many engineers understand very thoroughly the action of anion and cation exchangers, who consider it beneath their interest to look for lipstick on drinking glasses or to check the chlorine in the cold water rinse of some beer joint? The public health attitude, the perception of hazards, and the conception of their impact on groups of people, is the first essential in developing opportunities in public health.

The interpretation of the term "public health engineer" is frequently much too narrow. Generally, it is applied to an engineer associated with an official public health agency, who is concerned almost solely with inspection and with the enforcement of laws and regulations. Such a concept does not consider the important contribution of four other groups, without whom the health department engineer would be almost helpless.

First are professionally trained

\* Presented before the Engineering Section of the American Public Health Association at the Seventy-fifth Annual Meeting in Atlantic City, N. J., October 10, 1947.

people responsible for the operation of engineering works. The chief operator of a municipal water works, the industrial engineer who runs a plant to remove objectionable pollution from factory wastes, the superintendent of a sewage treatment plant, all make a definite contribution to the protection of the public health. With the official agencies, this group forms a team, each member of which is reliant upon the other for full effectiveness. The health department cannot keep an inspector in every water plant, every sewage plant, every milk plant, or in fact in any such place, all of the time. The operating agency has a responsibility for careful compliance with established health standards, and the excellence of a public health program depends largely upon the excellence of operating personnel. Experience has shown repeatedly that poor operation can nullify the best of planning and an otherwise superior program.

However, another group of engineers is essential to the team—if the health department engineer must depend upon the operator, the operator must in turn depend upon the designing engineer to furnish him with a plant capable of performing its function. The idea is often expressed that a consulting engineer should be required to operate each new plant which he designs for perhaps a year, the reason being that he should develop detailed knowledge of the operator's problems. The idea is good, in that it not only leads toward improvements in design, but also emphasizes the dependence of the operator upon the designing engineer.

Quite a similar relationship exists in the case of the manufacturer of equipment. In fact, in milk pasteurizing plants and food establishments, the equipment people almost entirely supplant the designer, and such establishments are frequently built around more or less standardized units of equip-

ment. Even in the fields of water and sewage treatment, traditionally the stronghold of the consulting sanitary engineer, the overall engineering designs are greatly influenced by choices of equipment. This should stimulate the manufacturer, for it develops an element of competition and new and improved equipment is likely to follow.

Behind all of these groups stands another, which has a profound influence upon the entire field of public health engineering. It is a certain fact that the best trained personnel will turn in the best program and, conversely, poorly trained individuals can wreck a program at almost any point. Great stress is laid upon the educational qualifications of engineers, and upon in-service training of operators; and the proven benefits of this sort of program are very great. The group which furnishes instruction in public health engineering, the teachers in our educational institutions, are a fundamental part of a public health organization and exert a dominant influence throughout the whole field.

The effectiveness of each group, the health department engineers, the operators, the equipment manufacturers, the consulting engineers, and the teachers, increases in proportion to their understanding of and coöperation with all of the others. The teacher who has lost contact with field problems, or the equipment man who does not understand the basic principles of public health, are largely ineffective in promoting a sound program. All together, when motivated by a common goal, namely, the protection of the public health, these several groups can and do form a unified association, each playing a vital part.

With this broad concept of public health engineering, the many opportunities for trained engineers become quite apparent. The opportunity for any one is apt to lie in the field of his

greatest interest and talent. Within each sphere of activity there are many critical problems to be considered. There is need for basic research, some of relatively simple nature, but which has just never been tackled effectively, such as the effect of polluted water on bathers, and with that a sound criterion for bathing water quality. There is need for development and improvement of equipment, as is illustrated in the new technique for disposal of human wastes from railroad passenger cars; there is need for effective training of personnel where opportunities for an effective display of leadership are very great; there is need for constructive activity in all phases of public health engineering, not only in conventional sanitation, but in the fields of malaria control, industrial hygiene, and other areas of environmental sanitation. These and similar opportunities are awaiting constructive development. The highest development can probably be

attained by the closest possible association between groups; by a recognition of the principle that one good man can do a good job and another good man can also do a good job, but both together can do more than twice as good a job. That extra factor which is introduced as a result of joint effort is important, particularly when two widely different viewpoints converge upon a single problem.

One public health engineer may be fitted for teaching, another for selling, a third for operation and management, but all will find a sound development and a useful outlet for their abilities if they can keep forever in their minds and attitudes the public health consciousness; that their skill lies, not only in the mastery of complex and difficult problems, but in the ability to perceive hazards to the health of groups of people and to reduce or eliminate such hazards by the application of engineering methods.



# An Epidemic of Mild Gastroenteritis of Unknown Etiology Presumably Spread by Contaminated Eating Utensils

M. ALLEN POND, F.A.P.H.A., AND JOHN S. HATHAWAY, M.D.

*Departments of Public Health and University Health, Yale University, New Haven, Conn.*

## INTRODUCTION

**Extent of Outbreak**—This is the report of an outbreak of 64 known cases of nausea, vomiting, and diarrhea in a graduate school population of 322 adults of both sexes, of whom approximately 200 eat regularly in one dining hall. The infecting organism is unknown. The information used here was obtained by interview with 44 persons and from questionnaires returned by 112 others. The attack rate was 41 per cent in this group of 156 individuals, all of whom had eaten in the refectory mentioned.

**Clinical Findings**—During this outbreak, there were 3 cases severe enough to require infirmary admission. Each of these complained of nausea, vomiting, and diarrhea. In addition, 1 had general malaise. Their admission temperatures of 101° F., 104° F., and 100° F., returned to normal in 12, 24, and 36

hours respectively. These 3 cases presented no unusual findings, no evidence of marked dehydration, and, except for fever, no pronounced symptoms of toxicity. Two of these cases were admitted on April 13 and the third on the 18th. For each, symptoms appeared first on the day of admission.

Other than these 3, none of the patients was seen by a physician, although some had been confined to bed.

**Chronology of the Outbreak**—Data on the dates of onset and symptomatology for all cases are presented in Table 1 and Figure 1. When studying these data, it should be noted that the school had reopened after the spring recess on Thursday morning, April 10, 1947, and that no meals were served in the refectory on Sunday, April 13.

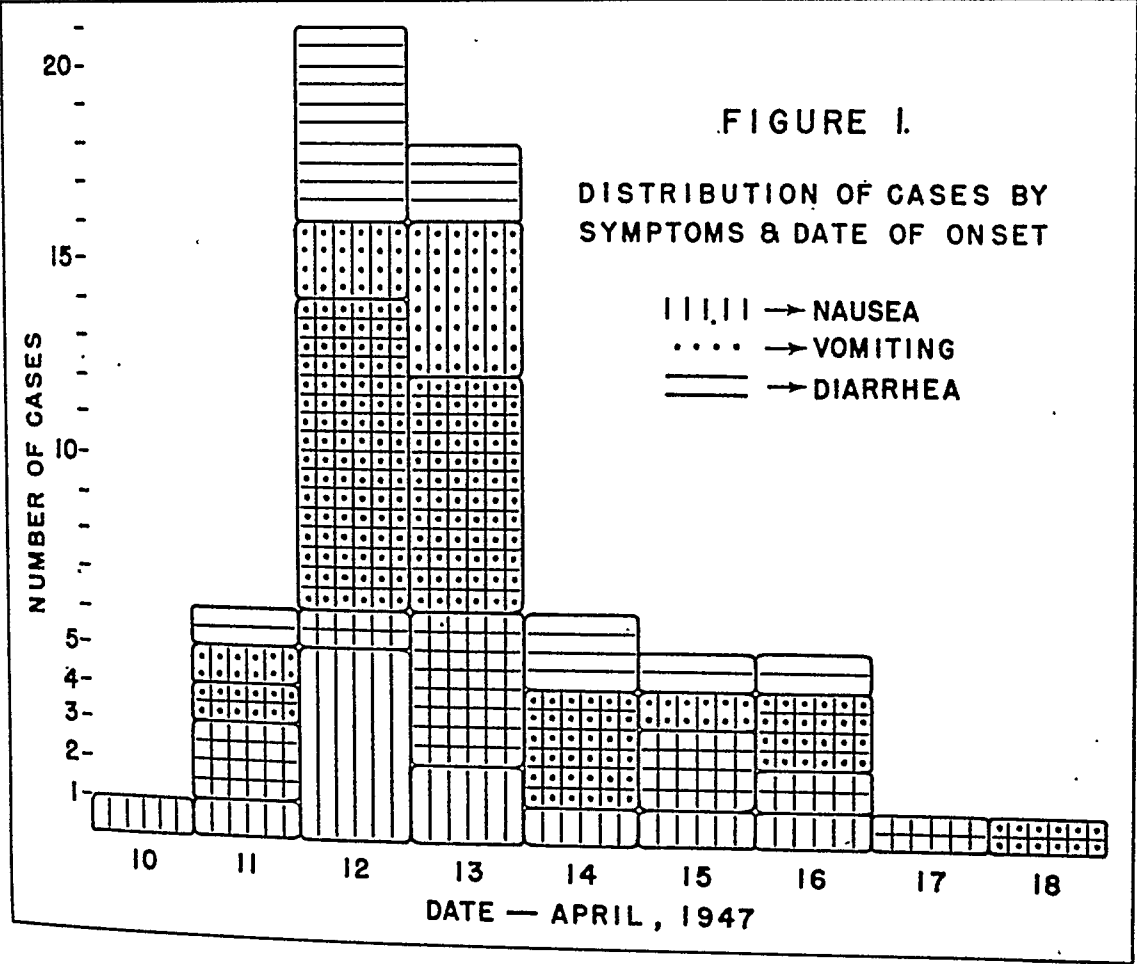
The curve suggests a primary source, or sources, of infection between April 10 and April 12. Nearly two-thirds (61

TABLE 1  
*Date of Onset and Symptoms for Each Known Case*

Symptoms	Date of Onset									Total
	4/10	4/11	4/12	4/13	4/14	4/15	4/16	4/17	4/18	
N	1	1	5	2	1	1	1	0	0	12
D	0	1	5	2	2	1	1	0	0	12
N & V	0	1	2	4	0	1	0	0	0	8
N & D	0	2	1	4	0	2	1	1	0	11
NV & D*	0	1	8	6	3	0	2	0	1	21
Total	1	6	21	18	6	5	5	1	1	64

Key: N = Nausea; V = Vomiting; D = Diarrhea

\* Included in this category are 2 patients who reported vomiting and diarrhea but no nausea



per cent) of the cases occurred on April 12 and 13, 11 per cent on April 10 and 11, and 28 per cent (delayed cases or secondary cases) between April 14 and 18. It does not seem likely, however, that infection at any single meal can have been responsible for the entire outbreak. We do not know the incubation period of this disease; but if we assume 2-38 hours, 39 per cent of the cases could have been caused by infection at the evening meal of April 12; while 34 per cent must have been caused before that meal. Infection at more than one meal on April 11 and 12 seems probable.

*General Epidemiological Investigation*—Reference to our daily epidemiological records made it clear that there was no concurrent increase in the incidence of gastrointestinal infection elsewhere in the university. Nor was any phenomenon of the kind noted in the community at large. On other grounds,

too, there was no reason to suspect generally distributed supplies such as water or milk.

Water for the school is taken from a public distribution system. Treatment consists of storage, slow sand filtration, and break-point chlorination, and the treated water flows by gravity from a covered storage tank. There were no known pressure failures at any point in the distribution system immediately preceding or during the outbreak. Plumbing in the school is comparatively new and is free of cross-connections. Daily bacteriological examinations of water samples collected from the distribution system near the school during April were negative.

On these facts alone, the water supply probably could be ruled out as a possible source of infection. Further evidence to remove the water supply from suspicion arises from the fact that several laboratories, classroom buildings,

TABLE 2  
Analyses of Milk Samples from University Supply after Pasteurization

Date	Bulk Supply		Bottled Supply	
	Plate Count *	Coliform †	Plate Count *	Coliform †
4/9	..	0 of 5	..	0 of 2
4/10	..	0 of 5	..	0 of 2
4/11	..	0 of 5	..	0 of 2
4/12	..	..	..	0 of 2
4/14	88,000	2 of 2	44,000	1 of 2
4/15	19,000	0 of 2	11,000	0 of 2
4/16	..	0 of 5	..	0 of 5
4/17	..	0 of 5	..	0 of 5
4/18	..	1 of 2	..	0 of 2

\* Standard plate count: Organisms/ml.

† Presumptive test: 1 ml. of inoculum in formate ricinoleate broth

Key: 0 = no. positive tubes

.. = no samples run

and the infirmary in the university proper are served from the same source, yet the outbreak was limited to this one school.

All milk used in the dining hall is pasteurized. Unlike any of the 12 other dining halls, this one is furnished "bulk" milk in 10 quart containers delivered daily. The supplies are otherwise the same. Careful study of the handling of this "bulk" milk revealed no serious shortcomings in technic. Thorough and practically continuous refrigeration of the milk is stressed. Samples of the university milk supply are examined frequently, and the record during the period April 9-18 was good (Table 2).

There is further evidence that the primary source of milk supply was not the vehicle of infection. Part of the milk supply for a local hospital is delivered in 10 quart cans from the same pasteurizer runs as for the school. The cans used are interchangeable and not specifically earmarked for either place. There was no concomitant outbreak of gastroenteritis among the hospital personnel drinking "bulk" milk.

*The Possibility of Infection by Food Handlers*—Clearly, the source of infection must have been a local one; and presumably connected with the handling of food or utensils. General conditions of cleanliness did not favor the possibility that rats or other vermin

could have played a rôle. Contact was not considered to be a likely means of spread primarily because the outbreak involved the gastrointestinal tract and there was no known respiratory disease in this population group at the time of the present outbreak or after it had subsided. Furthermore, the sharpness of the epidemic curve ruled out contact infection as a major factor.

We next, therefore, turned our attention to the problem of the "carrier in the kitchen."

Copies of the menus for all meals served in the 13 dining halls in the university are kept on file and are currently reviewed by one of us. In this instance attention was focused on two meals at which potentially hazardous foodstuffs (cream puffs and chicken salad) were served in the dining hall used by those who had been ill. It was soon evident that some of the patients had not been present at one or the other of these meals, and data subsequently obtained from the questionnaires definitely eliminated each of these meals as the sole focus of infection. Of the group sick at any time during the epidemic there was no single meal at which all ate together.

At the outset of our investigation, it appeared that none of the 11 full-time food handlers had recently been ill. Also, no one of the students employed

part-time in the pantry or dining room was known to be ill. Certainly none had been sick enough to stop working. However, by the end of the outbreak 3 student employees were discovered to have suffered from the prevailing infection. Two of these cases had their onset rather late in the outbreak (on April 14 and 16). The third of these employees, however, was the second case revealed in chronological order, credited in Table 1 to April 11. We shall return to this case in a later paragraph; but he did not handle any food served in the refectory.

During the flare-up, no attempt was made to obtain stool specimens from other than one itinerant employee. Our previous experience with bacteriological studies of similar outbreaks had been discouragingly futile. Dack<sup>1</sup> confirms our belief that there can be no substitute for painstaking epidemiological study in attempting to find the source of a presumably food-borne outbreak.

In this instance the start of our investigation was comparatively late, patients were but mildly ill, and we had no early evidence of the magnitude of the outbreak. In retrospect, our study would have been more comprehensive had we had laboratory help, and we cannot be sure that there would not have been significant findings from a thorough bacteriological work-up.

*The Possibility of Infection by Dishwashers*—It was intensive study of the earliest cases in the outbreak which ultimately opened up a reasonable explanation. It will be noted that Table 1 contains one entry for April 10. This student (X) became ill at 10 a.m. on that day, the morning that school reopened. He doubtless was infected elsewhere. He had nausea, chills, and "high fever," and was bedridden 3 days in his room.

Although X was not a dining hall employee, he roomed next to Y, the second person ill in the outbreak (the student

dining hall employee noted above). Y did not handle food, however, but was responsible for drying dishes and silverware after they were taken from the dishwashing machine at the morning and noon meals. He was nauseated from the morning of April 11 through the 14th, but never vomited and had no diarrhea. He was not bedridden, and did not leave his job.

There were no additional cases until late evening of April 11.

In the absence of any tangible evidence to demonstrate another source and mode of spread, it is suggested that Y is the probable source, and that contaminated dishes or silverware served as vehicles for the spread of the infection.

Further credence may be given to this theory inasmuch as the 11 full-time employees previously mentioned (none of whom was ill) eat the same food-stuffs that are served students, *but the employees' eating utensils are washed, dried and stored separately from those used by students. Y did not handle the employees' utensils.*

*Dishwashing Procedure*—A mechanical double-tank dishwater is used in this dining hall. There are indicating thermometers on both the wash and rinse water lines, and usual water temperatures at these stages are 142° F. and 170° F., respectively. At the time of our initial investigation of this outbreak the rinse water temperature was 165° F., and trays passed through the conveyor-type machine in 25 seconds. The dining hall supervisor stated that trouble had been encountered recently in keeping the wash water below 145° F., and that frequent adjustment with cold water was necessary. Because of the valve arrangement, the rinse water temperature was lowered simultaneously, but not below 160° F.

It has been the practice to "towel-dry" all eating utensils in the dining halls, primarily because glasses and

dishes otherwise are spotted or streaked. Even though we do not approve this practice, it is our opinion that the methods used are satisfactory. An ample supply of clean, well laundered towels is provided at each meal. Bacteriological analysis of swab samples taken from utensils before and after towelling have revealed no significant changes in counts, and in any event the number of colonies found has been far below the usual standard of 100 per utensil.

In retrospect, a noteworthy fact was recorded at the time of our first inspection on the morning of April 14: A relatively large number of "clean" dishes, stored in warming cabinets, had adherent cooked food particles, principally egg yolk and jam. No particular attention was paid to this finding at the time except to have all dishes rewashed.

All dishes in regular use are stored between meals in uninsulated but bright-walled warming cabinets, heated from steam coils. Steam pressure of approximately 16 lbs. per sq. in. is maintained between 6 a.m. and 10 p.m., and with the cabinets closed the air temperature approximates 150° F.

Previous tests have shown that utensils in closed warming cabinets are subject to bactericidal action, and that counts on such utensils drop approximately 90 per cent when stored 4 hours. However, we were able to demonstrate

that a 24 hour broth culture of *Staphylococcus aureus*, when smeared in thin film on a clean, sterile Petri plate, proliferated after 7 hours in a closed warming cabinet of which the air temperature was constantly in the range 149°–158° F. (65°–70° C.). Similar tests made simultaneously with *Salmonella enteritidis* and *Micrococcus caseolyticus* were negative.

In practice, the doors of warming cabinets are frequently left ajar, and occasionally wide open. Although no temperature readings were made in the warming cabinets at the time of the epidemic investigation, dishes could be handled easily, indicating that the temperature was probably well below 150° F.

#### SUMMARY

An outbreak of 64 cases of acute gastroenteritis of unknown etiology has been described. After sifting all available evidence, it is concluded that the disease was spread by contaminated eating utensils. Data to support this theory are presented.

ACKNOWLEDGMENT — We are grateful to Professor C.-E. A. Winslow and Miss Margaret A. Bowers for their helpful advice and assistance.

#### REFERENCE

1. Dack, G. M. Problems and Errors in Assigning Causes of Bacterial Food Poisoning. *A.J.P.H.*, 37: 360–364, 1947.

# Relation of Certain Cooking Procedures to Staphylococcus Food Poisoning\*

DOROTHY L. HUSSEMAN, PH.D., AND  
F. W. TANNER, PH.D., F.A.P.H.A.

*Department of Home Economics, University of Wisconsin, Madison, Wis.;  
and Department of Bacteriology, University of Illinois, Urbana, Ill.*

THAT the incidence of staphylococcus intoxication must be considered as one of the ranking problems facing public health workers interested in food sanitation is evidenced by the rapidly increasing number of confirmed cases reported. Much difficulty has been encountered in the laboratory in attempting to elucidate and to harmonize the many facets which the problem presents. This is a report on a study of one of the more practical aspects of the staphylococcus food intoxication problem: an attempt to establish thermal death time-temperature relationships for one strain of staphylococcus in cream filling and to correlate the results thus obtained with the temperatures attained in accepted cooking procedures for cream filling. Bacteriological examination was made of cream filling subsequent to placing it in cream puff pastries. It appeared that information of such a nature might be of some help to public health officials who were interested in the requirements for cooking cream

fillings, the re-heating of pastries as a means of protecting the public against illness due to the ingestion of staphylococcus in cream filled products, and the part played by the food handler in the contamination of such products.

The effect of cooking procedures on the survival of staphylococci has been investigated in other laboratories. In 1931 Dack, Woolpert, Noble, and Halliday<sup>1</sup> observed that staphylococci introduced into either sponge or butter cake batter were killed during the baking process. All viable cells seemed to be destroyed when the interior temperature of the sponge cake batter reached 75.2°C. Staphylococci introduced into cream filling were said by these authors to be destroyed during cooking, but no detailed data on this point were presented. Coughlin and Johnson<sup>2</sup> without presenting experimental evidence suggested that in order to prepare custard mix (cream filling) safely it should be heated to not less than 200°F. for 10 minutes, and then cooled promptly. Cathcart, Merz, and Ryberg<sup>3</sup> reported that cell suspensions of *Staphylococcus aureus* inoculated into the "thickening mix" of custard (cream filling) were destroyed by bringing the product to the boil. Internal temperatures of the cream fillings were not reported by these

\* Presented before the Food and Nutrition Section of the American Public Health Association at the Seventy-Fourth Annual Meeting in Cleveland, Ohio, November 14, 1946.

Based on portions of a thesis presented by Dorothy L. Hussemann in September, 1946, to the Graduate School of the University of Illinois in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Bacteriology.

authors, but were apparently assumed by them to be at or near the boiling point of water.

The rebaking procedures for cream filled pastries suggested by Stritar, Dack, and Jungewaelter<sup>4</sup> to insure greater safety to the consumer necessarily required investigation of rate of heat penetration into such products. They recommended the routine use of ovens heated from 190.6°C. to 218.3°C. for 30 minutes. Cells of staphylococci inoculated into the cream filling were found to be destroyed by such treatment. Maximum temperatures for the cream filling within the pastry of 75°C. for 5 minutes and of 76.7°C. for 6 to 8 minutes were recorded for uncovered and covered pans, respectively. Gilcreas and Coleman<sup>5</sup> reported somewhat similar data. Using inoculated custard (cream filling), the latter workers observed that no viable staphylococci cells were demonstrable following rebaking of eclairs. They determined that by such a procedure a maximum temperature of 71°C. was found to exist in the cream filling for a period of more than 5 minutes.

The investigations of Hucker and Haynes,<sup>6</sup> Nunheimer and Fabian,<sup>7</sup> and of Ryberg and Cathcart,<sup>8</sup> which indicate that temperature necessary to free a mixture of ingredients of staphylococci is related to the composition thereof, cannot be ignored.

#### MATERIALS AND METHODS

##### *A. Preparation and bacteriological examination of cream filling:*

The formula and procedures used for the cream filling were as follows:

Flour	80 gm.
Sugar	200 gm.
Salt	6 gm.
Milk, reconstituted evaporated	980 ml.
Eggs	200 gm.
Vanilla	6 ml

The sugar, flour, and salt were mixed

and then made into a paste with 100 ml. of the milk. The remainder of the milk was placed in the top of a 1½ quart double boiler, and a copper-constantin thermocouple attached to an automatically recording six-point recorder\* was inserted into it. The milk was heated until it foamed and then it was poured with stirring into the sugar, flour, salt, and cold milk mixture. During this time of mixing and for all others, measurement of temperature was discontinued and was reinitiated when the mixture was returned to the stove for further cooking. The milk containing the thickening mixture was heated in the upper part of the double boiler over 1 liter of boiling water for 8 minutes, by which time it had attained maximum thickness. It was then covered with a tightly fitting lid, perforated in such manner that a thermocouple was permitted to pass through. Heating was continued for 15 minutes, the mixture being uncovered and stirred at 5 minute intervals. The hot mixture was then added to the eggs with stirring. The water in the lower part of the double boiler was adjusted to 90°C., and the cream filling was heated in the upper part of the double boiler for another 5 minutes. At the conclusion of this cooking, the whole was beaten for 30 seconds with the electric mixer† at medium speed in order to assure uniformity and to hasten cooling. The cream filling was then poured into two cream soup plates and placed in a refrigerator which registered 4°C. for 30 minutes. Hydrogen ion determinations were made on the filling using a potentiometer.‡ Seventy gm. of the cream filling were weighed into each of eight previously prepared cream puff pastries.

Adequate supplies of all staples and

\* Micromax, Leeds and Northrup, Philadelphia, Pa.

† Powermaster, Sears Roebuck and Company, Chicago, Ill.

‡ Leeds and Northrup, Philadelphia, Pa.

milk for use throughout these experiments were obtained before beginning work. The eggs, produced by the university flock, were purchased as needed, two dozen at a time. The laboratory worker washed her hands in mercuric chloride solution, then in soap and water, and dried them on a sterile towel previous to beginning cookery each day. Frequent washing of the hands in soap and water was practised throughout the ensuing time of work. A face mask, covering nose and mouth was worn during all manipulative procedures.

The cream puff pastries which were prepared in the laboratory were handled with wax paper. The tops of the pastries were cut off, the cream filling was inserted, and the tops replaced. The filled cream puffs were wrapped in a wax paper and stored in four different ways: two were quick-frozen immediately, two were placed in a household refrigerator, two were held at room temperature, and two were placed in a 37°C. incubator. At the end of 24 hours and again at the end of 48 hours, a small amount of filling and a small amount of pastry from one cream puff representing each method of holding were each placed in 10 ml. of sterile water and shaken thoroughly. Phenol red mannitol agar and bromthymol blue lactose agar pour-plates were inoculated with these suspensions. Eight baking trials were made, and from these 256 platings.

Any colonies appearing on the plates were transferred to nutrient agar slants, incubated at 37°C. and the growth thus obtained was studied microscopically, using the Gram stain.

#### B. Thermal death time determinations:

1. Preparation of sterile cream fillings—A cream filling was prepared by the method described above except for the following alterations in ingredients and procedures: (1) All equipment to be used including bowls, spoons, knives, double boiler and lids were sterilized in

the autoclave. Ingredients were weighed into these sterile containers and were immediately covered with the paper which had been in place during sterilization. Mixing in so far as possible was done under these papers or sterile lids.

(2) Specially treated flour and sugar\* were obtained. In our laboratory these ingredients were sterile on all test platings on tryptone glucose extract agar.† (3) No thermocouple recordings were made during the heating. (4) After thickening following the addition of the flour and sugar to the milk, the mixture in the upper part of the double boiler was placed over the direct flame and brought to a vigorous rolling boil for 5 minutes and then returned to over-water cooking, and allowed to cool sufficiently so that it could be added to the eggs. (5) At the conclusion of cookery the filling was poured immediately into four weighed, sterile metal cups, which were attachable to an electric blender. Approximately the same quantity of filling was placed in each cup. The cup was opened as briefly as possible and as soon as the filling was placed therein, and the cover returned, the whole was placed in a refrigerator. The pH value of each batch of cream filling prepared was determined electrically.

2. Preparation of the inoculum—Twenty-four hour growth of *Staphylococcus aureus* Strain C12069 (Dolman) from 2 large tryptose agar slants‡ was suspended in 10 ml. of sterile saline. The saline suspension from both slants was poured into a 200 ml. Erlenmeyer flask which contained 40 ml. of sterile saline and glass beads, and was shaken. The suspension was diluted until, using matched tubes, a reading of 40 per cent light transference was obtained on a photoelectric turbidimeter, using a

\* The Griffith Company, Chicago, Ill.

† *The Difco Manual*, Difco Laboratories, 7th Edition, p. 23

‡ *Ibid*, p. 90



yellow-green filter, number 530.\* Preliminary tests had shown that such a reading was approximately equivalent to 100,000,000 cells per ml. of suspension.

3. Preparation of thermal death time tubes, heating and plating—Aliquots of the cream filling for use as control experiments were withdrawn from the cans and manipulated in the same manner as the inoculated samples.

A sufficient quantity of the suspension of cells of *Staphylococcus aureus* Strain C12069 described above was added to the cream filling remaining in the metal cup to give a calculated inoculum of 100,000,000 cells per gm. The inoculum was incorporated by beating for 3 minutes with the electric blender.† Platings of 1 ml. of this inoculated filling in 1:1,000,000 dilution were made on tryptone glucose extract agar. The average of the plate counts for all such platings made (47) served as a measure of the number of cells in the unheated filling.

One ml. portions of the inoculated cream filling were put into thermal death time tubes of the type described by Sognefest and Benjamin,<sup>9</sup> using a standard sterile 10 ml. syringe and a 12 gauge, 5 in. needle. The tubes upon receiving the 1 ml. of inoculated filling were covered with cotton until sealed. Triplicate tubes were used at all temperatures and at all time intervals in each experiment. In all cases at least 3 complete experiments, and thus 9 tubes, were used. This is essentially the technique first proposed by Bigelow and Esty.<sup>10</sup>

After sealing, the tubes containing the inoculated filling were heated in a DeKhotinsky constant temperature oil bath‡ for varying lengths of time. The temperature of the oil bath was con-

trolled by means of a thermo-regulator, and the heat was kept uniformly distributed throughout the bath by an electrically operated stirring device. At 55°C. the time intervals of heating were 4, 5, 6, 7, 8, 10, 12, and 30 minutes; at 65 and 75°C. the time intervals were the same except that the 30 minute observation was omitted. At 85°C. 2, 3, 4, 5, and 6 minutes were the intervals employed.

Upon the completion of heating, the tubes were iced instantaneously. Removing the filling from the tubes was accomplished by adding 1 ml. of sterile saline to the filling in the tube and mixing with a sterile, cotton-plugged, capillary pipette. After a uniform mixture was obtained, a measured quantity was placed in a test tube containing a sterile saline dilution blank.

It was necessary for the final dilutions of the inoculated filling to vary with the time and degree of heating in order to secure plates which were suitable for counting. The dilutions which were found to be applicable in this series of experiments are indicated below.

55°C.—all time intervals—1:400,000

66°C.—all time intervals—1:2,000

75°C.—all time intervals—1:200

85°C.—all time intervals—1:200

In all cases 0.1 ml. of the dilution shown above was plated. The platings were made on tryptone glucose extract agar. The counts were recorded and the per cent of survivors calculated.

As a basis for comparison the thermal death time temperature relationships of the same strain of *Staphylococcus aureus* in a pH 7.0 phosphate buffer was determined in a similar manner. One ml. portions of suspension of viable staphylococci cells standardized as to approximate number by use of the photo-electric turbidimeter placed in thermal death time tubes. These tubes were sealed and heated in the constant temperature oil bath. The temperatures and times used

\* Photovolt Corporation, New York, N. Y.

† Stevens Electrical Company, Racine, Wis.

‡ Central Scientific Company, Chicago, Ill.

TABLE 1

Showing the Percentage of Surviving Cells of *Staphylococcus aureus* Strain C12069 (Dolman) When Heated in Cream Filling for Varying Times and Temperatures (Inoculum Approximately 113,000,000 Cells per Milliliter)

Time in Minutes	Organisms Surviving 55° C.† Per cent	Organisms Surviving 65° C.‡ Per cent	Organisms Surviving 75° C.‡ Per cent	Organisms Surviving 85° C.‡ Per cent
2	.... *	....	...	0.01
3	....	....	...	0.0
4	132.6	0.22	0.0	0.0
5	263.5	0.22	0.0	0.0
6	120.6	0.05	0.0	0.0
7	159.9	0.13	0.0	...
8	17.3	0.0	0.0	...
10	34.3	0.0	0.0	...
12	26.0	0.0	0.0	...
30	8.2	....	...	...

\* No tests.  
† Values Represent Average of 18 Trials.  
‡ Values Represent Average of 9 Trials.

in this series were: 4, 5, 6, 7, 8, 10, 12, and 30 minutes at 45 and 55°C. and 4, 5, 6, 7, 8, 10, and 12 minutes at 65 and 75°C., respectively. After heating, dilutions were made as follows:

- 45°C.—all time intervals—1:10,000
- 55°C.—all time intervals—1:1,000
- 65°C.—all time intervals—1:100
- 75°C.—all time intervals—1:100

One-tenth ml. of the final dilution as indicated was plated on tryptone glucose extract agar, and counts were made and recorded. These counts were compared with the average number of cells known in approximation to have been present in the unheated phosphate buffer suspension, by counts of 46 platings. Percentages of survivors were calculated.

The time which was required for the temperature of the contents of the tube to reach the temperature of the oil bath (lag time) was determined for both the cream filling and the phosphate buffer, using a specially constructed copper and constantin thermocouple\* and a potentiometer indicator.† Time in

seconds for this lag was noted using a stop watch and was recorded.

RESULTS AND DISCUSSION

In Table 1 are presented the results obtained in the thermal death time determination for *Staphylococcus aureus* Strain C12069 (Dolman) in cream filling. It can be seen that small numbers of this organism (8.2 per cent) seemed to survive heating for more than 30 minutes at 55°C. Furthermore, with the cream filling as the suspending medium, this strain of *Staphylococcus aureus* apparently was killed by 8 minutes of heating at 65°C., less than 4 minutes of heating at 75°C., and less than 3 minutes of heating at 85°C. The average pH value for the cream filling was 6.48. A consideration of the time lag in the penetration of the heat into the cream filling in the tube must be made, however, before these values for time-temperature relationships in destruction of the organism can be accepted as absolute. The lag times in heating at 55, 65, 75, and 85°C. were respectively: 2 minutes 10.0 seconds; 2 minutes 22.1 seconds; 2 minutes 28.3 seconds; and 2 minutes 31.0 seconds. At all temperatures there was a substantial length of time before the cream filling within the

\* Furnished through the courtesy of Dr. J. M. Jackson, American Can Company, Maywood, Ill.  
† Number 522169, Leeds and Northrup, Philadelphia, Pa.

tube reached the temperature being tested for its lethal effect upon the cells. It is probable, therefore, that viable cells were destroyed in somewhat less time than is indicated for each temperature in Table 1.

For all of the control experiments using sterile cream filling and the techniques described, the results were negative. No colonies appeared on the tryptone dextrose extract agar plates even though the tubes of cream filling were heated for only the shortest time interval under test.

The results obtained when a phosphate buffer with a pH value of 7, was used as a suspending medium for viable cells of *Staphylococcus aureus* Strain C12069 (Dolman) are shown in Table 2. Sterilization was apparently effected at a lower temperature under this condition. Growth on tryptone dextrose agar later was obtained from the suspension of cells heated 30 minutes at 45°C. This was also true to a slight degree for cells heated up to 7 minutes at 55°C. However, beyond that point and at all time intervals tested at 65°C. and 75°C., the viable cells apparently were killed. Uninoculated phosphate buffer, manipulated in the same manner as the cell suspensions appeared to be sterile. As might have been expected, lag in time of heating the tube contents to the temperature of the oil bath was less for phosphate buffer than for the

cream filling. These lag times were determined to be 44.2 seconds, 54.6 seconds, 1 minute 37.2 seconds, and 1 minute 51.8 seconds, at 45°, 55°, 65°, and 75°C., respectively.

It would appear that during the preparation of the filling, the milk, flour, and sugar were maintained at a temperature of above 65°C. for much longer than the 8 minutes apparently necessary for sterilization of staphylococci. Following the addition of the eggs, the temperature appeared to remain above 75°C. for a sufficient length of time to free the mixture from staphylococci.

These findings were further verified when cream fillings were plated, which were carefully prepared from ingredients purchased in ordinary retail markets, placed in cream puff pastries, and held under varying conditions. Growth appeared on 92 of 256 plates but staphylococci were never detected. For the most part the organisms recovered appeared to be large spore-bearing rods and occasionally *Sarcina*. Staphylococci could have been overgrown on many plates in this series but on the whole, with the temperatures known to have been applied during cookery and a knowledge of the thermal death relationships of the organism in cream filling, it appeared that this filling was sterile for staphylococci when cooking was completed.

In the thermal death time trials at 55°C. the increase of cells above 100

TABLE 2

Showing the Percentage of Surviving Cells of *Staphylococcus aureus* Strain C12069 (Dolman) When Heated in Phosphate Buffer, pH 7, for Varying Times and Temperatures (Inoculum Approximately 96,000,000 Cells per Milliliter)

Time in Minutes	Organisms Surviving 45° C.* Per cent	Organisms Surviving 55° C.* Per cent	Organisms Surviving 65° C.* Per cent	Organisms Surviving 75° C.* Per cent
4	2.6	2.2	0.0	0.0
5	2.8	0.8	0.0	0.0
6	2.7	0.55	0.0	0.0
7	2.1	0.2	0.0	0.0
8	1.7	0.0	0.0	0.0
10	1.7	0.0	0.0	0.0
12	4.4	0.0	0.0	0.0
30	3.3	0.0	...	...

\* Values Represent Average of 9 Trials.

per cent of the inoculum may require comment. It seemed possible that the very length of the manipulation may have been explanatory. However, a series of experiments in which the cream filling was held in ice from the point of inoculation and except for the heating period to the moment of plating, seemed not to eliminate the phenomenon. It may have been that certain of the procedures used succeeded in breaking up cell clumps. At the longer heating periods, cell metabolism may have been driven to a higher pitch and thus cell multiplication occurred more rapidly.

The method used here for mixing and cooking cream filling differed in some details from the method described by Stritar, Dack, and Jungewaelter<sup>4</sup> and Cathcart, Merz, and Ryberg.<sup>3</sup> The variance occurs chiefly in degree of heat applied. At no point in the techniques here reported was the mixture boiled. This method is in harmony with the recommendation of many authoritative quantity cookery recipe books and is based upon the usual principles for proper starch and egg cookery.

The thermal death temperature-time relationships determined here may perhaps be applicable to the feasibility of rebaking cream filled mixtures as a public health prophylactic measure. When the temperatures attained in the rebaking procedures developed by Stritar, Dack, and Jungewaelter<sup>4</sup> were compared with critical thermal death times and temperatures as observed here, it appeared that their method allowed for reaching the minimum or in excess of the minimum for destruction of staphylococci, when the cream puffs were maintained in an oven of 190.6°C. for 30 minutes. The technique for rebaking of cream filled mixtures as described by Gilcreas and Coleman<sup>5</sup> allowed little, if any, margin of safety in time and temperature necessary to destroy organisms, when considered in light of the results presented

here. Apparently there is some merit in the rebaking procedures but it would appear that bakers must be cautioned to control the conditions carefully under which the work is done, or a false sense of security may result.

#### SUMMARY AND CONCLUSION

Using the multiple tube method, an attempt was made to establish thermal death time-temperature relationships for staphylococci in cream filling and to correlate such findings with the range and duration of temperatures attained in accepted cooking procedures for cream filling. One strain of *Staphylococcus aureus* was used as the test organism. Thermal death time determinations for the same organisms were also made at a range of temperatures, using a pH 7 phosphate buffer solution for the suspending medium.

In the range of temperatures studied, *Staphylococcus aureus* Strain C12069 (Dolman) was found apparently to survive for 30 minutes at 55°C. and to be destroyed in less than 3 minutes of heating at 85°C. In phosphate buffer solution, pH 7, the organism survived somewhat less stringent heat treatment. It appeared that at the conclusion of such a cooking procedure, cream filling was free from viable staphylococcus.

#### REFERENCES

1. Dack, G. M., Woolpert O., Noble I., and Halliday, E. G. Experimental Study of Possible Routes of Contamination of Cakes with Food Poisoning Staphylococci. *J. Prev. Med.* 5:391 (Sept.), 1931.
2. Coughlin, F. E. and Johnson, B. Gastroenteritis Outbreaks from Cream-Filled Pastry. *A.J.P.H.* 31:245 (Mar.), 1941.
3. Cathcart, W. H., Merz A., and Ryberg, R. E. Staphylococci and Salmonella Control in Foods, IV Effect of Cooking Bakery Custards. *Food Research* 7:100 (Mar.-Apr.), 1942.
4. Stritar, J., Dack, G. M. and Jungewaelter, F. G. The Control of Staphylococci in Custard-filled Puffs and Eclairs. *Food Research* 1:237 (May-June), 1936.
5. Gilcreas, F. W. and Coleman, M. B. Studies of Rebaking Cream-filled Pastries. *A.J.P.H.* 31:956 (Sept.), 1941.
6. Hucker, G. J. and Haynes, W. C. Certain Factors Affecting the Growth of Food Poisoning Micrococci. *A.J.P.H.* 27:590 (June), 1937.
7. Nunheimer, T. D. and Fabian, F. W. Influence of Organic Acids, Sugars and Sodium Chloride upon

Strains of Food Poisoning Staphylococcus. *A.J.P.H.* 30:1040 (Sept.), 1940.

8. Ryberg, R. E. and Cathcart, W. C. Staphylococci and Salmonella Control in Foods, II Effect of Pure Fruit Filling. *Food Research* 7:10 (Jan.-Feb.), 1942.

9. Sognefest, P. and Benjamin, H. A. Heating Lag in Thermal Death-time Cans and Tubes. *Food Research* 9:234 (May-June), 1943.

10. Bigelow, W. D. and Esty, J. R. The Thermal Death Point in Relation to Time of Typical Thermophilic Organisms. *J. Infect. Dis.* 27:602 (Dec.), 1920.

---

## Haven Emerson to Deliver Cutter Lecture

The Harvard School of Public Health announces that Dr. Haven Emerson, Emeritus Professor of Public Health Practice, Columbia University School of Public Health, New York, will deliver the Cutter Lecture on Preventive Medicine on November 24, 1947, at 5 p.m. in Amphitheatre D of the Harvard Medical School. Dr. Emerson has chosen as his subject, "Whither the

Pegasus of Public Health?" The Cutter Lectures on Preventive Medicine have been held since 1912, according to the terms of the will of Dr. John Clarence Cutter, of the class of 1877, which directed that they should be "free to the medical profession and to the press." In addition, medical and public health students and others interested are cordially invited to attend.

# Canada Sees New Horizons for Health Education\*

LT.-COL. C. W. GILCHRIST, O.B.E., E.D.

*Director of Information Services, Department of National Health and Welfare, Ottawa, Canada*

IN order fully to appreciate the scope and progress of health education work north of the 49th parallel, one must first have a quick glimpse of the geography, the economy, and the governmental set-up of Canada.

Here is a vast country, with lines of communication covering more than three million square miles, whose population of twelve and a half million is concentrated in a "strip" along the southern border. Here is a nation which in a quarter century has twice marched to war and in eleven years of all-out effort contributed men, money, machines. Here is a nation now risen from comparative obscurity in world affairs to a secondary power, third only to the United States and Great Britain as a trading nation.

With a central federal authority and nine autonomous provincial governments, Canada has its problems of administration. There are the "have" and "have-not" areas. There are the two official languages.

But certainly in the twin fields of health and welfare there is very close federal-provincial coöperation. It has developed over the years, despite the fact that the British North America Act of 1867, Canada's Constitution, only very sketchily laid down the responsibilities of governments at the two levels.

The Dominion had certain statutory obligations—among them, administration of the Food and Drugs Act, the Quarantine Act, The Opium and Narcotic Drugs Act. Responsibilities were divided among several departments, but in the broad field of public health education comparatively little was accomplished on the federal level until 1944 when Parliament passed "An Act To Establish a Department of National Health and Welfare." It was to take over the health function of the Department of Pensions and National Health.

One of the most important provisions of the new act was this: "Coöperation with provincial authorities with a view to the coördination of efforts made or proposed for preserving and improving the public health and providing for the social security and welfare of the people of Canada."

It was early seen that one of the most effective measures of coöperation would be that of health education. The provinces, active in varying degrees in such fields as child and maternal health, nutrition, mental health, blindness control, industrial health, dental health, venereal disease control, welcomed the emergence of such new divisions at the federal level. Busy with the organization of local health units and other administrative detail, provincial authorities were pleased to take advantage of consultative services and health education materials made available to them free of charge.

\* Presented before the Public Health Education Section of the American Public Health Association at the Seventy-fifth Annual Meeting in Atlantic City, N. J., October 10, 1947.

In November, 1946, the first Dominion-Provincial Health Education Conference was held. Such a conference had been recommended by the Dominion Council of Health, which has often been referred to, somewhat erroneously, as "Canada's Health Parliament." The Council is composed of the chief executive officer of the provincial department or Board of Health of each province, representatives from the fields of science, agriculture, labor, and English and French-speaking women's organizations. Twice yearly for three days the Council meets in Ottawa under the chairmanship of the Deputy Minister of National Health and, while it is not empowered to make regulations, its recommendations to the Minister have resulted in many health improvement measures of far-reaching significance.

This year health educators and others in the field will be called together again as guests of the Department of National Health and Welfare. Under review will be the first full year of coöperative effort toward improvement in quality and output of health education materials at all levels. Continuing to provide leadership in the production of books and pamphlets, radio material, posters, displays and films, the federal department has also acted as a clearing house for ideas and materials produced by provincial authorities, thus insuring that all parts of the country are kept acquainted with progress elsewhere.

Health educators of the government services and those with voluntary agencies are unanimous in their opinion regarding the teaching value of the motion picture. The Department of National Health and Welfare has during the last year or two devoted a sizable slice of its education and information budget to this medium. Not only have we produced 17 films and filmstrips of varying length, with 13 more in production or in the scripting stage, but we

have built up in conjunction with the National Film Board, four one-print film libraries. There are a Public Health Library with 150 titles, a Biological and Medical Library for professional use with a like number of prints, a Physical Fitness and Recreation Film Library, and a Welfare Library, the latter newly organized.

All the best material from Canada, the United States, Britain, and many other countries is screened and evaluated by professional and lay committees, and prints are made available to government departments, organizations, or individuals on a low-cost rental basis.

The National Film Board, a government agency, is responsible for all original productions, and I should like to call attention to the fact that several of our Canadian films are being shown daily in Mr. Stowell's "little theatre."

New productions include the following "Mother and Her Child," "Let's Look at Water," "Your Morning Milk," "Know Your Baby," "Condition Improved" (occupational therapy); "Rural Health," "Small Fry" (pointing up the contribution of Family Allowances to the welfare of Canada's children); "Sixteen to Twenty-Six" and "Very Dangerous" (adapted from R.C.A.F. venereal disease films for female and male audiences respectively); "What's on your Mind" (mental health); "Stanley Takes a Trip" (a color cartoon film on nutrition), and "The Feeling of Rejection."

The last mentioned is the first in a proposed series entitled "Mental Mechanisms" designed to illustrate the development of personality factors which often lead to emotional difficulties and physical distress. It is, we believe, a valuable tool in group psycho-therapy and is useful for parent-teacher education and in the instruction of social workers, nurses, and medical students.

Then, scheduled for release is a film on "Hostility," the second in the

Mental Mechanisms series; two short films on Rural Sanitation and Rat Control; a two-reeler on Immunization, stressing parental and community responsibility; a color film on Dental Health; a color filmstrip and a black-and-white film for professional use on Narcotic Drugs; a brief film called "Fit for Tomorrow" on community recreation programs; a film on Restaurant Sanitation; a series of six cartoon filmstrips under the title "Why We Eat" and another filmstrip, called "Internal Triangle" showing the adaption of Canada's Food Rules to meal planning.

The first-named film—"Mother and Her Child"—which is in color and synchronized sound and 50 minutes long, is based on the book *The Canadian Mother and Child*, written by Dr. Ernest Couture, director of our Division of Child and Maternal Health. More than 800,000 copies of the 232 page book have been distributed free in the last few years and we are now going into the seventh reprint. In addition to the film we have produced two complementary filmstrips on prenatal and postnatal care—"Nine to Get Ready" and "Introducing Baby." Films are produced in both English and French.

In printed materials the aim always is toward attractive format, bright design, interest, readability. We believe the health story can be told effectively in everyday language. Scientific gobbledy-gook is out. Old publications are constantly under revision and new ones planned.

The success of this policy may be indicated by the fact that last year we published and distributed free to the provinces and to organizations and individuals more than two million pieces of printed material. New Zealand has recently requested permission to reprint one of our booklets. Tasmania is interested in another.

One publishing project planned is a series of three companion pieces to *The*

*Canadian Mother and Child*. They will cover the growth and development of the child from one to six, the school-age child and the adolescent. Another afoot is a series of four booklets under the general title "Posture's Important."

All publications, including posters, are produced in English and French editions. This includes three monthly periodicals—*Canadian Nutrition Notes*, *Industrial Health Bulletin* and *Canada's Health and Welfare*. The last is the departmental magazine; with a circulation of 85,000, it serves as an informational liaison link between all branches of government down to the municipal level and voluntary organizations.

As an example, the magazine is now carrying a series of illustrated supplements on specific health subjects. The first of these was on cancer and 450,000 copies were made available to the Canadian Cancer Society for distribution.

The federal department, indeed, co-operates closely with all national voluntary health and welfare organizations. Newsclips and exhibits have been provided free to the Health League of Canada, and the film on immunization mentioned above, is being made to tie in with the League's national immunization campaign. The Canadian Welfare Council formerly produced quantities of literature on child care and training for sale near cost. These publications have now been taken over by the federal department, being revised and reissued free through Information Services Division.

More recent additions to the Health Branch of the department—new Divisions of Hospital Design, Civil Aviation Medicine, Health Insurance Studies, Civil Service Health, Epidemiology—all pose special problems and bring new opportunities in the field of health education. For the first named, as an example, we have published a portfolio of plans of small hospitals and health



units which, like all our literature, goes free to provincial departments and municipalities.

There is a challenge, too, in the work of the Welfare Branch of the department which is responsible for the Old Age Pensions Act, the Physical Fitness Act, and administration of Family Allowances.

Canada is the only country of the Western Hemisphere with a system of family allowances. Every child in Canada—and there are now 3,704,622 registered—receives a monthly payment, ranging from \$5 to \$8, from the government. It is paid to the mothers from the time the child is born to 16 years of age. On an average month 22 million dollars goes out by cheque. In the two years and three months since Family Allowances came into being nearly 550 millions have been distributed, mostly among the wage earners in the lower brackets.

We know that Family Allowances have accomplished several things already. There has been an improvement in the dietary habits of the nation. Notably there has been an increase in the consumption of milk and milk products as well as fruits. There has been an improvement in school attendance, because that is one of the conditions of payment—and many children are now being properly clothed and equipped to go to school. The psychological effects are incalculable.

In two years there has yet to be a conviction for misuse of these allowances, but there is much to be done in an educational way to insure the *best* use. It is a task of the Information Services Division to help tell thousands of mothers about better money management.

Canada's Indians and Eskimos get Family Allowances, too. Some of them in remote areas are paid "in kind"—that is, receive the value of their cheques in goods from local trading posts.

Much is being done, more planned, to improve the health of Indians and Eskimos. Cooking courses and home-makers' classes are carried on. We have produced colorful calendars with simple health slogans to go out with Family Allowance cheques. Films are used extensively for teaching, and we are now producing literature in Cree and Eskimo syllabics as well as English and French.

I earlier mentioned radio as a medium. The Canadian Broadcasting Corporation has done a notable job in the health education field. Not only do we maintain a close liaison, but the CBC producers also work with other government departments and voluntary agencies in telling the story to the public. For the CBC and private radio stations in Canada we produce a regular service of broadcast material.

The press, as always, coöperates splendidly, and it is worthy of mention that more than one-half of the weekly newspapers in Canada, both English and French, publish a weekly column produced and issued by my division. In times of epidemic or emergency the daily newspapers and the radio stations can always be relied upon to flash the necessary warnings and instructions to the public.

I regret that there is not space to discuss in detail the health education programs in the provinces, five of which—British Columbia, Alberta, Saskatchewan, Manitoba and Quebec—have full-time health education divisions. May I leave with you, just a few highlights:

*British Columbia* points with pride to the fact that she leads all the western provinces in percentage of population covered by full-time health units as well as in number of health units. More than 65 per cent of the population is served by this modern type of health program. In addition, public health nursing service is available to nearly 90 per cent of the population. A consultant in health education, Miss Kay McNevin,

was added to the staff early last year. The Health Department and the Department of Education are planning and conducting experiments in venereal disease education in high schools.

*Province of Alberta*—One of the most notable experiments in the province was carried out in the Lamont Health District. As a publicity and teaching enterprise for the benefit of the housewives of the district, a six week camp for undernourished boys was conducted. The unusual nature of the camp, together with the general improvement in the health of the thirty boys who attended, aroused much interest, and the community was ready for and receptive to further nutrition education. Projects in community nutrition were expanded. These included the distribution of vitamins to preschool and school children, location and publicizing of local food sources with information on the best preparation of such foods, dietary surveys and general education implemented by lay participation, and nutrition education in the schools.

In *Saskatchewan* the Division of Health Education, headed by Christian Smith, has hitched its educational program to the family and it has consistently maintained a psychiatric approach to delinquency, venereal disease, alcoholism, and other subjects. Relating this to the changing school curriculum, the division has persuaded the Department of Education to introduce family life education in the secondary schools, starting in Grade 10 and developing this as a compulsory subject for both sexes in Grades 11 and 12 (senior matriculation). The Department of Education has also been persuaded to include human reproduction in physiology (starting at Grade 10) and the venereal diseases with communicable diseases in Grade 10 study.

In the realm of publicity and public relations, the division in two months "sold" the compulsory hospital services

insurance plan to the people of the province; helped to persuade 35,000 residents of a rural area to accept full-time public health services on a regional basis; conducted a successful recruiting campaign among high school graduates, university students, and teachers for mental hospital staffs.

*Manitoba*—Springboard of activities for the Division of Health and Welfare Education in Manitoba is the Health Services Act of 1945. Its four parts include the organization of health units, diagnostic services, prepaid medical care and hospitals. Various parts of the province are concerned with one or more phases of the plan and it is the responsibility of the Director, Miss Margaret Nix, once the details of the plan are complete, to go into the area and, with every educational and publicity means available, prepare the community to pass the necessary by-laws. In every case the votes have been favorable. Twelve health units which cover 45 per cent of the population have been organized, one diagnostic unit, four general hospitals, and twelve medical nursing units.

In *Quebec*, the Director of Health Education is a medical doctor, Jules Gilbert, who is also Assistant Director of the School of Hygiene, University of Montreal. The outstanding feature of his program has been the building up of a staff of public health educators of whom he now has 13 working in as many county health units with the adult population. These health educators are nurses with a pedagogical background and experience who have received additional training at United States universities. New health educators will be trained at the Montreal University School of Hygiene. In the field of school health, Quebec has sent 11 normal school teachers and school inspectors to take a full year's training in school health education at universities in the United States. Recently the

school health curriculum for elementary grades was revised, and to give impetus to this program a degree course in health education for teachers has this year been introduced at the Montreal University School of Hygiene with an initial enrollment of 40.

In *Ontario*, most populous of Canadian provinces, health education work is directed and correlated by Dr. D. S. Puffer, assistant to the chief medical officer of health. A notable recent development was an amendment to the Public Health Act providing for free medical examination of expectant mothers. Feeling that it was necessary not only to inform the public fully but to do an educational job on the doctors too, Dr. Puffer's office had 250,000 letters prepared and circulated outlining what it was hoped to accomplish by the new legislation.

The job was thorough. The regulation is applicable only within the boundaries of *Ontario*, but the health department finds doctors sending in reports on expectant mothers resident in *Manitoba*,

*Quebec*, and even the State of *New York*!

The Maritime Provinces of *New Brunswick*, *Nova Scotia*, and *Prince Edward Island* have taken notable strides since war's end setting up new public health services. The tools of health education available from the federal department are particularly useful to those provinces whose funds for development of their own materials are at a premium.

And so it is that the coöperative effort in Canada goes on. There have been many evidences of improvement in the health of the nation over the years. Further improvement is dependent largely upon informed and enlightened public opinion. Health education has many sides to it. It is a long-term investment. Together with other departments of government, with professional and lay groups, and with voluntary organizations, the Department of National Health and Welfare is at all times working to evolve practices which will raise the level of health and welfare of the whole Canadian people.

# Administrative and Research Uses of Routine Analyses of Hospital Statistics\*

PAUL M. DENSEN, D.Sc., F.A.P.H.A.

*Department of Preventive Medicine and Public Health, Vanderbilt University  
School of Medicine, Nashville, Tenn.*

IN recent years, there has been a trend toward enlargement of the scope of statistical services in state and local health departments. To the traditional registration functions of the vital statistics office, more analytical functions have been added, sometimes directly within the vital statistics office; sometimes in some other division of the health department but still in close co-operation with the registration office.

This growth is the result of the recognition of the need for more factual data to aid in defining the nature and scope of the problems confronting the health department, to serve as the basis of intelligent planning for their solution and, finally, to furnish a means of evaluating the effectiveness of the attack on these problems.

In many hospitals, at the present time, there is a similar awareness of the need for quantitative analyses, both of problems within the hospital and of problems having to do with the relationship of the hospital to the community. In many instances, this awareness has crystallized in the development of a statistical unit within the hospital not unlike that which has com-

plemented the work of the registration office of the health department.

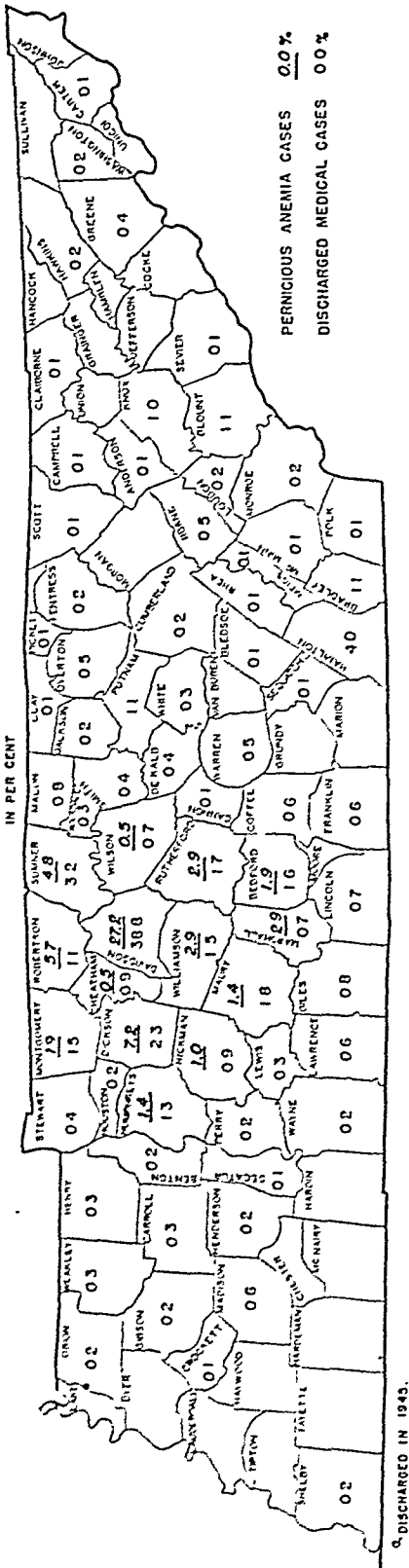
It is proposed here to present a few of the administrative and research uses of analyses of various types of hospital data. While the examples used reflect the experience of the Vanderbilt University Hospital, similar analyses are being made in many other hospitals. The examples have been chosen to emphasize a point; namely, that there is present, in the material accumulated in the hospital histories in the ordinary course of events, a wealth of information which, if tabulated and analyzed routinely, can point the way for more efficient hospital administration, indicate special problems needing study, and provide background data which may be used to great advantage in research problems.

## ANALYSES OF DATA PERTAINING TO THE HOSPITAL AS A WHOLE

Every hospital history contains such basic facts as history number of the patient, his age, race, residence, and, in addition, certain data regarding his hospital experience such as length of stay, the service from which he was discharged, his status on discharge, and the final diagnosis. The general pay status may also be included, such as ward, low cost private, or private patient.

\* Presented before the Vital Statistics Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 13, 1946.

FIGURE 1  
DISTRIBUTION BY RESIDENCE OF 1744 PATIENTS DISCHARGED FROM THE MEDICAL SERVICE<sup>a</sup>  
AND OF 309 PERNICIOUS ANEMIA CASES SEEN IN VANDERBILT HOSPITAL FROM 1925 TO 1945  
IN PER CENT



From such information made available in easily tabulated form, as a punch card, a number of interesting administrative questions may be studied. For example, occupancy rates are usually available for the hospital as a whole but, like the crude death rate, the overall occupancy rate sometimes obscures situations revealed more clearly by specific rates. In a private hospital which relies for part of its income on the fees paid by private patients, the hospital administrator finds it useful to know the occupancy rate of the private service and of the ward service. Occupancy rates by department of the hospital are also very interesting. The rate of one department is not always comparable with that of another (e.g. obstetrics vs. medicine), but each department may be compared with itself over a period of time and the effect of changes in staff or of administrative policies on occupancy easily evaluated.

Many uses may be found for tabulations of the place of residence of the patients. In itself, it is desirable to know what area the hospital serves, especially if the hospital needs of the area are to be considered. Such data are also pertinent to any problem involving follow-up of patients, and they often prove of value from a research standpoint. For example, one of the clinicians noticed that the pernicious anemia cases seen in the hospital seemed to come from certain counties. The same observation had been made quite independently by another clinician and they wanted to know if there was any way to study the correctness of their impression quantitatively. It seemed reasonable to assume that if there was no geographic concentration of the cases, the distribution should not differ from that of other medical discharges. The number of pernicious anemia cases seen in a hospital like Vanderbilt over a period of time is not very great, so that the control series of discharges

would have to be fairly large if significant differences were to be demonstrated. To tabulate a sufficient number by hand would have been a rather laborious job but it was a simple matter to run the routine punch cards for the necessary data.\* The results are shown in Figure I.

Study of Figure I confirms the impression of the clinicians. The differences seen in Robertson, Dickson, and Marshall Counties are greater than would be expected from chance alone. Moreover, the fact that the counties are not contiguous and that Davidson County, in which Vanderbilt Hospital is located, has a smaller proportion of cases than would be expected, suggests the hypothesis that the observed data are the result of a selective phenomenon

of some kind, possibly related to the concentration of physicians and their ability to diagnose pernicious anemia. Here, then, a simple tabulation from routinely collected data has answered a simple question which might otherwise have gone unanswered or have led to a laborious and expensive research project.

It may also be emphasized that the collection on punch cards of such routinely available data permits the accumulation of large numbers of observations which may serve as reliable controls for many hospital problems which of themselves yield only small study groups.

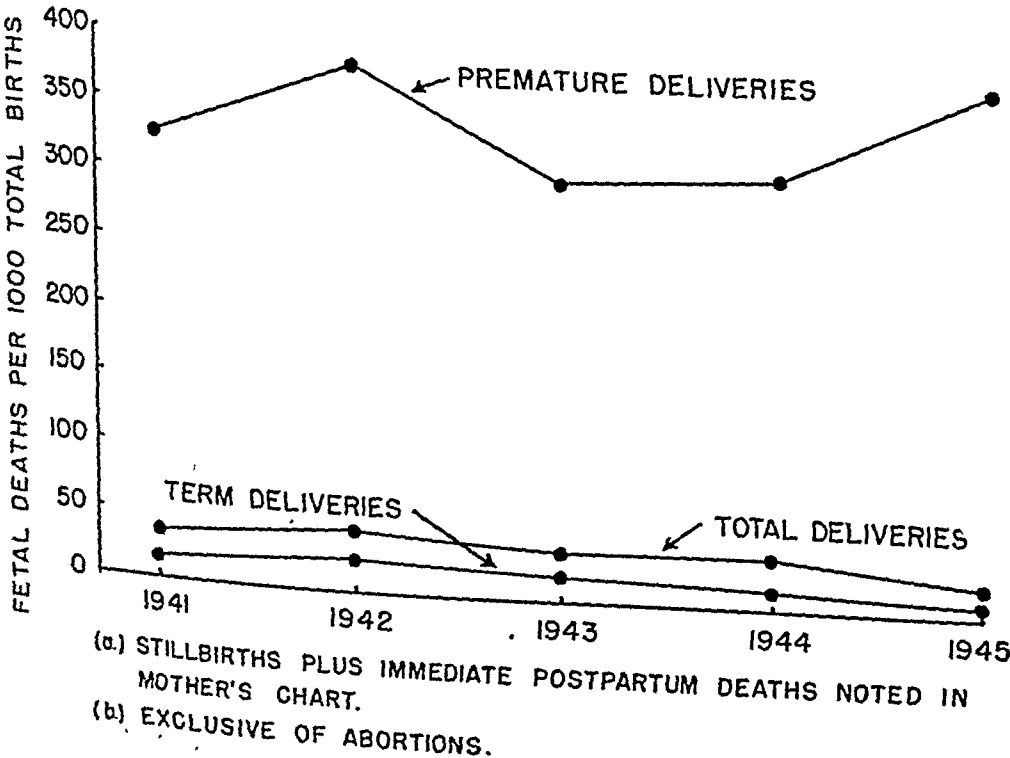
ANALYSES OF THE RECORDS OF  
INDIVIDUAL DEPARTMENTS

In addition to the routine collection and analyses of data contained in the histories of all departments of the hospital, punch cards may be developed

\* While the pernicious anemia cases were tabulated for the period 1925-1945, the data on all medical discharges were available on punch cards only for 1945.

FIGURE II

FETAL MORTALITY<sup>a</sup> IN ALL DELIVERIES<sup>b</sup> AND IN PREMATURE AND TERM DELIVERIES AT VANDERBILT HOSPITAL 1941-1945



by each department which will contain much more detailed but still routinely collected information than the card developed for the hospital as a whole. Some of the uses of such cards developed for individual departments follow.

#### *Obstetrics Department:*

Many administrative uses have been found for the data on the obstetrics punch cards. At the beginning of the war, the accelerated rise in the birth rate resulted in considerable crowding of the obstetrics facilities of the hospital, and the question arose as to how many more bed days would be made available if patients who had no complications were not permitted to remain in the hospital more than one week. It was a simple matter to sort out these cases, make the frequency distribution of length of stay in the hospital, and

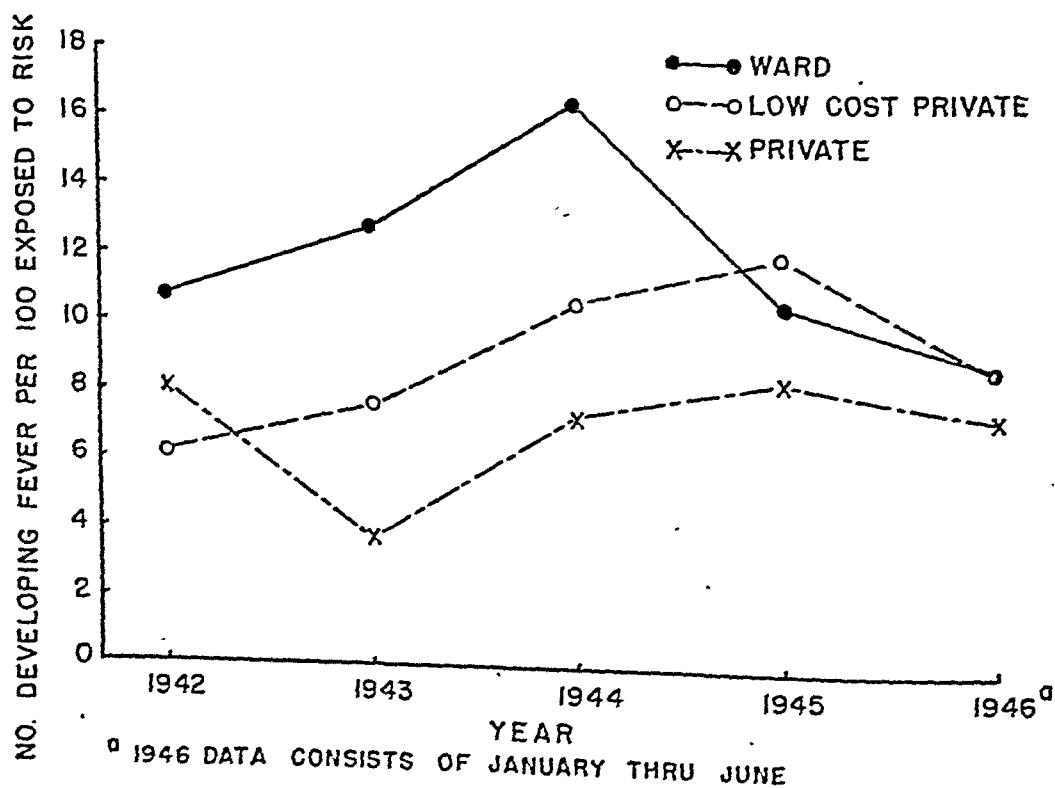
observe the effect of reducing it to 7 days.

The statistics shown in Figure II on the fetal mortality among infants delivered in Vanderbilt Hospital have been used by the Pediatrics Department to indicate the need for a premature nursery. That they constitute a potent argument is self-evident.

From the research standpoint, the data collected on the same cards have proved of considerable value especially with respect to puerperal fever. In fact, the development of the punch card itself was enlightening for it became quickly apparent that the concepts of puerperal fever held by the obstetrics staff at the time were not very clear. Some included any temperature over 100°F. as puerperal fever; others used 100.4° as the dividing line. Some included the first 24 hours after delivery; others did not.

FIGURE III

#### PUERPERAL FEVER RATE BY PAY STATUS VANDERBILT HOSPITAL 1942-1946



Obviously a definition was needed. One was provided and the first tabulation with this definition was made in 1942. The results were surprising and are shown in Figure III.

Ward patients showed a puerperal fever rate in excess of 12 per cent, low cost private patients showed the next highest rate, and private patients had the lowest rate. The rate for ward patients seemed excessive and the rates were rising. Tincture of zephiran sprays were used by the obstetrics department in 1943 with no apparent effect. Vaginal instillations with an aqueous solution of zephiran were tried late in 1944 and early in 1945, still with no apparent effect. Then about April, 1945, the practice of issuing monthly reports on puerperal fever was adopted and the problem was kept constantly in front of the interne staff. They, in turn, posted a list in the nurses' station on the ward of all patients delivered and whether or not they developed puerperal fever. A noticeable spirit of rivalry developed and it came to be considered almost a disgrace for an interne to have one of his patients develop puerperal fever. It may be seen from the graph that the rate for 1945 was lower than for any of the three preceding years, and for the first 6 months of 1946 it has fallen to a new low and is now at the level of the rate for the low cost private patients. Since there had been no changes in obstetric practice during this time except for the exercise of greater caution in handling patients as a result of the constant awareness of the danger of puerperal infection, the drop in the rate appears to be due to the emphasis placed upon the problem.

As the data on puerperal fever were accumulated over several years, another advantage of routine tabulations of such data became apparent. The full study of the problem requires breakdowns along such lines as whether or not an operation was performed, whether there

was any relationship to the patient's hemoglobin level and packed cell volume, whether there were differences between primiparae and multiparae, etc. Breakdowns of this sort require a fairly large number of cases if the influence of the various factors is to be evaluated, but if the data are accumulated on punch cards, in time sufficient material becomes available so that they can easily be made. The labor involved in extracting the necessary data from the same number of cases all at one time is usually so great as to prohibit any attempt to make detailed analyses.

An important off-shoot of these routine analyses of the obstetrics records has been the Vanderbilt Coöperative Study of Maternal and Infant Nutrition. The impetus for this study arose out of discussions in 1944 of the apparent consistency of the differences in the puerperal fever rates among ward, low cost private patients, and private patients. Two possibilities were considered at the time: (1) that the differences might be due to differences in exposure resulting from different numbers of patients in a room in each of the three groups; (2) that the differences might be due to differences in nutritional status of the three classes of patients. Certain detailed tabulations suggested that the first hypothesis was probably not the sole explanation of the differential in the puerperal fever rate. Since the relation of nutrition to various aspects of pregnancy was of interest in itself, a detailed study of the subject was undertaken embracing several departments of the medical school. The relationship of puerperal fever to nutrition is just one aspect of the study, but it was the initial discussion of the results of the routine analyses that was the springboard for the development of this detailed research program.

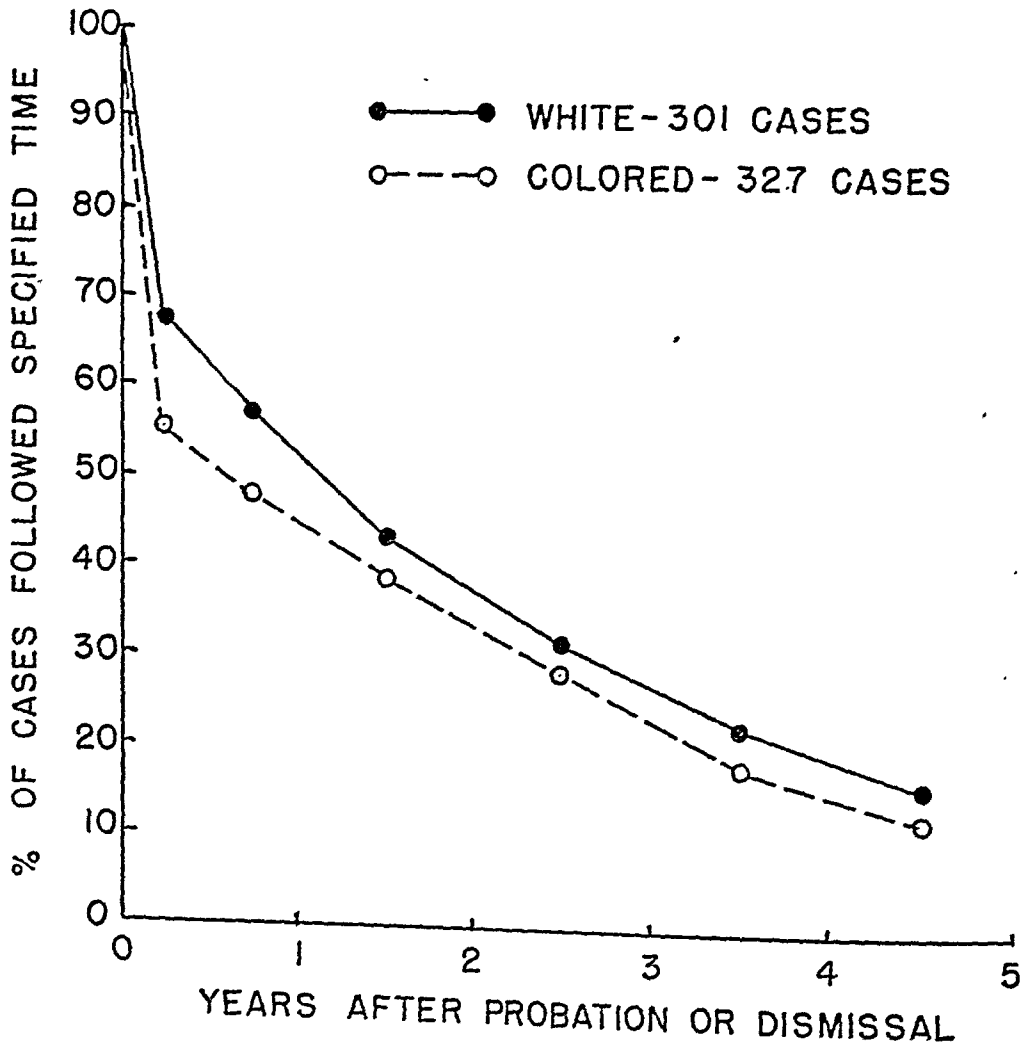
#### *The Syphilis Clinic:*

The punch card for patients coming



FIGURE IV

PERCENT OF SYPHILIS CASES PROBATED PRIOR  
TO 1941 FOLLOWED IN VANDERBILT HOSPITAL  
CLINIC FOR SPECIFIED TIME PERIOD

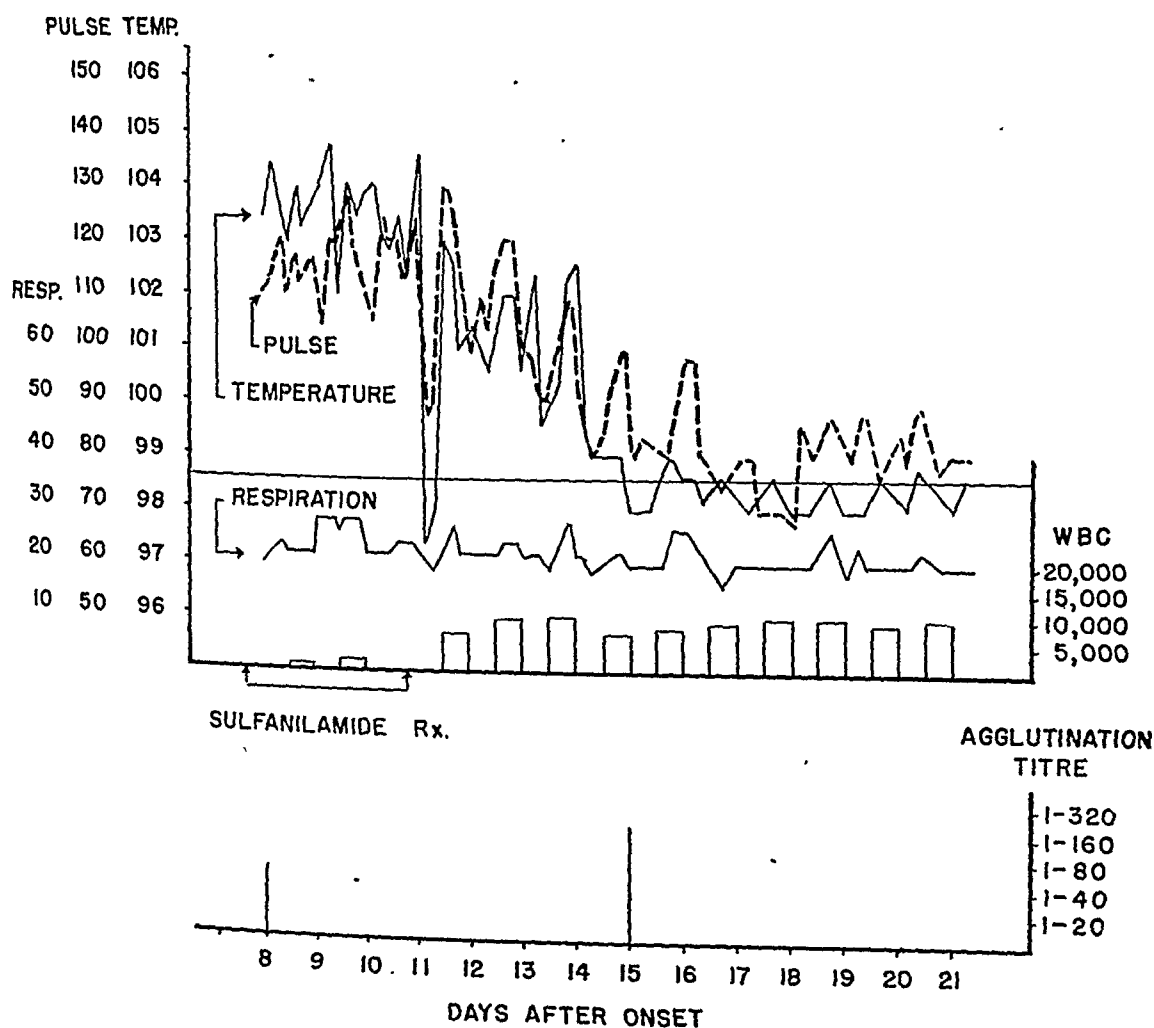


to the syphilis clinic contains, in addition to identifying information, data with respect to diagnosis, treatment, results of serological tests, referral source, status at the time of disposal, and results of follow-up. Many analyses have been made of these data. The material in Figure IV illustrates one such analysis.

Patients who complete their treatment and who are placed on probation are asked to return each 6 month period up to one year and yearly thereafter. It is

seen from Figure IV, however, that between 30 and 40 per cent of these patients are lost to observation within 6 months, and considerably less than half are followed for as much as 2 years. Information of this type is of considerable significance with respect to the problem of evaluating the effectiveness of treatment. It is futile to seek such an evaluation in terms of the probability of a relapse within a stated period of time, for the condition of those

FIGURE V

CLINICAL AND LABORATORY FINDINGS IN A CASE OF TULAREMIA - PULMONARY  
TYPE - SEEN IN VANDERBILT HOSPITAL 1938

who do not return to clinic is unknown and it may very likely differ considerably from the findings on those who do return. The analyses of the data routinely available in the records indicate that more effective means of following patients must be sought if evaluation in terms other than mortality is desired. Similar analyses can be made for any other clinic in which an attempt is made to have patients return for routine examinations.

#### *The Hospital Laboratories:*

Hospital laboratory records contain a wealth of data which if routinely analyzed and correlated with other records should do much to aid in the

understanding of the pathogenesis of disease and of the clinical significance of the laboratory findings. What is needed for such understanding is a continuity of observation which, unfortunately, is not present in the histories as often as it might be. For example, the director of the bacteriology and serology laboratories at Vanderbilt has made it a practice to bring together data in the histories of certain patients on whom laboratory procedures are requested. Figure V shows some of the data on a case of tularemia in which the laboratory was requested to run an agglutination test. One would like to know here what the course of the agglutination titer was as the clinical symptoms subsided. The

significance of the observed rise in titer cannot be fully appreciated without further observations. Routine bringing together of observations such as those in Figure V should eventually result in improvement in the records.

There is always a great temptation for the hospital staff to place considerable reliance upon a single laboratory report. If the report is positive, further observations may be desirable as shown in the example just cited. If it is negative, its significance may be still more obscure, depending as it does on such things as the way in which the specimen was collected, the accompanying clinical symptoms, and other factors. Attempts to evaluate such factors raise questions as to the information which the laboratory would like to have on the request for examination forms and as to the selection of patients on whom examinations are requested. Many of these questions can be studied by routine tabulation of the information present in the histories, and this in turn should result in the desired continuity of data.

#### *Records of Hospital Employees:*

Another source of information which lends itself well to routine analysis is the records of hospital employees. In many ways a hospital is like an industrial plant. It usually carries a sizeable number of people on its payroll, who are exposed to risks peculiar to the hospital environment just as workers in a steel mill are to their particular hazards. Industry has found that it pays in dollars and cents to maintain a health service and to keep records of industrial absenteeism. Relatively few hospitals, however, analyze their records in the same manner, yet all the necessary data are routinely available. The size of the employee population is known and the accounting office usually keeps a record of absences. If the hospital provides a health service for its employees, records are kept as to the causes of illness. All

that is needed to develop absenteeism data is organization of the already available records from the statistical point of view. Analyses of such data would not only be of administrative value but, if broken down as to type of hazard, would be of considerable research interest. For example, the absenteeism rate of laboratory workers might be compared with that of the housekeeping staff, just as the rate of workers in one department of a plant is compared with that of another.

#### GENERAL BENEFITS

Sufficient examples have been given to show that there are innumerable opportunities for analyses of the administrative and research aspects of hospital work. There are, moreover, certain general benefits not related to any particular department, which derive from the development of such analytical procedures in the hospital. As one department follows another in seeking to study the information routinely available in the records, a more critical attitude toward record keeping begins to develop. Records are looked at in terms of their potential statistical uses as well as their use with regard to the individual patient, and in the long run the records tend to improve.

The routine analysis of the records is also productive of much excellent teaching material. In a non-teaching hospital, such material as that cited above on puerperal fever results in an indirect form of staff instruction. In a teaching hospital, material on the prevalence of various conditions among the patients is of value in illustrating points in the courses in obstetrics, pediatrics, medicine, pathology, and others. If courses in medical statistics are given, laboratory problems can easily be constructed from the files of punch cards.

It is often found that analyses of the records point up problems which two or more departments of the hospital

may have in common, and fosters co-operative undertakings. A good example of this is the Coöperative Study of Maternal and Infant Nutrition previously mentioned. Then again, such analyses point the way for integration of preventive medicine practices with procedures in various clinics, as, for example, in indicating the need for x-raying all patients by examining the proportion of patients with a history of contact with tuberculosis.

But the development of routine punch card files is not only of value in correlating the work of one department with that of another; it should also be useful in correlating the records of the various hospitals in the community. As record forms and procedures are standardized, it should be possible to put together data for all the hospitals in the community to give a better idea of the hospital problem of the area. For example, if all the hospitals in Nashville routinely tabulated where their patients

came from, it would be possible to obtain a hospitalization rate for the city, inasmuch as only a very small proportion of residents are hospitalized outside the city.

Not only should routine punch card files aid in coördinating the records of the various hospitals in the community, but they should also prove useful in tying together the records of other agencies with those of the hospital. In many communities there is a woeful lack of coördination of the efforts of hospital clinic workers with those of other social agencies and with the public health agencies. The punch card files may present opportunities for identifying groups of individuals who may be found in the records of more than one agency, and this should do much to clarify some of the health problems of the community. In general, then, routine analyses of hospital records may be of benefit not only to the individual hospital but to the community as a whole.

# Functions of Standing Orders for the Nurses in Industry\*

IRVING R. TABERSHAW, M.D., AND  
MARGARET S. HARGREAVES, R.N.

*Liberty Mutual Insurance Company, New York, N. Y.*

A **STANDING** order may be defined as an order for some form of treatment, medication, or procedure to be carried out by a nurse in the absence of a doctor. To be valid, it must be written, signed by a doctor, and applicable to a specific patient or situation. Such orders are of particular value in a hospital where they provide for standardized procedure, expedite care and treatment of patients in the temporary absence of the doctor. If carefully examined, standing orders in recognized hospitals will be found to consist only of the usual techniques which a nurse is qualified to perform in those situations which require neither diagnosis nor prescription. Patients admitted to a hospital are usually seen by a physician before or upon admission. The standing orders of a staff doctor therefore, merely serve as a guide for nursing routine to be carried out in his absence on patients whose condition he has diagnosed. They define what the nurse is permitted to do with the doctor's approval in his absence.

The problem of standing orders for nurses who see patients before a doctor is available for diagnosis and prescription is different. Visiting nurses are frequently called upon to give care in a

home before a physician arrives, and usually have standing orders to cover such situations. These orders are commonly formulated by a local public health agency and are very limited. They frequently do not even permit a visiting nurse to execute without a doctor's order, a procedure which could be classified as an ordinary home remedy. For instance, except in unusual cases such as a child in convulsion, standing orders of a well conducted public health department do not permit the giving of an enema without a specific order from the doctor. In fact, many organizations will not permit a second nursing visit on any case unless first seen by a doctor. Continued nursing care to a patient is rarely permitted without medical supervision. The attitude of these public health organizations is correct since they wish to protect the nurse from practising medicine, and realize that not only is the nurse not licensed or capable of practising medicine but that they do not have the authority to permit her to do so.

An analogous situation exists in industrial medicine where nurses are frequently called upon to work with inadequate or no medical supervision. In order to define their duties, in 1932 the Wisconsin State Medical Society issued "Suggestions for the Guidance of the Nurse in Industry." At the request of nurses, who under wartime conditions

\* Presented before the Industrial Hygiene Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 13, 1946.

were conducting medical departments in industry without the guidance of a physician, in 1943 the Council on Industrial Health of the American Medical Association issued "Standing Orders for Nurses in Industry." In this bulletin, it is suggested, where nurses are working without adequate medical supervision, that written orders be requested from the committee on industrial health of the local or state medical society. Industrial nurses have welcomed these orders and their official organizations consider it an evasion of responsibility on the part of a physician who refuses to sign standing orders for his nurse. The majority of industrial nurses maintain that this procedure gives them legal protection, greater prestige, and greater elasticity of function. Although not basic functions of standing orders, they do provide these benefits if they limit the nurse to nursing practice and truly represent medical supervision in the absence of the doctor.

Field experience with industrial medical departments of many types and sizes in various parts of the country convinces us that the real function of standing orders is not always understood by management, by the majority of nurses, and by many doctors. Generally, two types of interpretations are placed upon their function. One is that its purpose is to give the nurse more leeway than she normally should have, and standing orders really represent permission to practise medicine. We have seen many such orders where a doctor has given permission to the nurse to diagnose, treat, and even suture in his absence. The second type of interpretation is that it is a device to limit the nurse from doing anything but the simplest first aid and record keeping. This type of standing orders reduces the nurse to the status of a record clerk and first aider who refers everything to the physician. The most extreme example that we have seen is one in which a plant

nurse (who was registered and qualified) was instructed in case of doubt to call the physician's office where, in his absence, she would receive instructions from his office nurse.

The term "standing orders" is used rather loosely to cover any act that a nurse may perform in absence of the doctor. Standing orders may be classified in two types—those that relate to situations which recur frequently and those that relate to treatment of a specific patient. The Standing Orders of the American Medical Association and other committees on industrial health are actually outlines for first aid procedures, and the original pamphlet issued by the Wisconsin State Medical Society is entitled "Suggestions for the Guidance of the Nurse in Industry." Nowhere is the word "Standing Orders" used, and in the foreword it is pointed out that it is approved only as an outline of first aid measures.

The necessity for defining the sphere of the nurses' functions in industry is evident in order to avoid a tendency to infringe on the practice of medicine. This situation may be due to management's desire to buy medical care cheaply which may lead the nurses to diagnose, treat, and even suture. They are commonly called upon to do preplacement physical examinations. Nurses, desirous of pleasing management accept the responsibility, but the more conscientious ones, wishing justification, demand standing orders from a doctor. Many standing orders are written by the nurse and signed by a doctor who has no clear concept of his responsibility and who is usually on an "on-call" basis having no responsibility to the plant first aid department except for treating cases as they arise. The nurse thinks that she is now permitted to do things she could not do before, management is satisfied in obtaining medical care for nurses' pay, and the doctor is untroubled as long as no liabil-

ity attaches to his act. Thus, what was intended as a curb on the practice of medicine is used as a license to do so. Doctors who realize their responsibility in creating standing orders refuse to sign equivocal orders which may be construed as permitting the nurse to practise medicine.

Orders which outline procedures for the emergency care of occupational injury or illness are not really standing orders but first aid guides suitable for industry at large, or for a particular industry where certain types of these injuries and illnesses are common. These procedures are carried out within the professional qualifications of a registered nurse without a doctor's authority. However, since each doctor has preferences, these guides state his specific wishes, or if written by a committee on industrial health, outline what is a generally acceptable procedure. Standing orders really relate to treatment of specific patients, and before they can be applied it is necessary that a diagnosis be made, e.g., a standing order for heat to a sprain implies that a diagnosis of sprain has been made. Making a diagnosis is legally the practice of medicine. It can be done only by an individual with proper training and qualifications who is licensed by law after passing an examination. Such authority cannot be delegated.

If medical supervision is adequate, standing orders are not needed, for example, in those industries where full-time plant physicians are in charge. A part-time plant physician whose responsibility is to supervise the nurse may properly issue standing orders to cover some situations in his absence. Since they represent the liaison between doctor and nurse they should be based upon the doctor's regard for the nurse's judgment and ability. In one plant a doctor was willing to write standing orders for one nurse but not for the other. The "on-call" doctor who has no in-plant

responsibility could not and should not be asked to issue orders, but may properly issue a guide for the nurse to follow before referring the case to him. The type of cases which need referral will depend on the ability and professional judgment of the nurse.

It must be recognized that there is a twilight zone where a nurse may properly give care without actually practising medicine. In New York State, excluding injuries which require immediate intensive care such as suturing, the nurse is permitted two maneuvers as first aid measures, that is, care at the onset of injury and one specific re-dressing. A first aid guide may cover these situations, but continued treatment of the patient demands the services of a doctor. If a doctor visits the plant periodically, he will have the opportunity to see the patient and relieve the nurse of the responsibility of continued care without diagnosis.

One function of standing orders is to cover those minor injuries or illnesses which do not demand the services of a doctor. Another function of standing orders is to cover the gap between the initiation of treatment and the visit of the doctor. A third function is to provide standard acceptable procedures for patients with injuries and illnesses which occur frequently in industry. These orders must be created by a doctor, who is not only responsible for the plant medical department but is also responsible for the diagnosis of injured or ill workers. The true function of standing orders does not imply that everything be referred to the doctor. Such orders do not recognize that the nurse is a professionally qualified person who is able to recognize symptoms and signs and to apply nursing procedures which may be effective in safeguarding the life and health of the patient.

The most frequently repeated need for standing orders and the one given the greatest weight by the nurses is that

it affords them legal protection. This view is shared by a number of industrial physicians. It might be well at this point to define legally one who practises medicine. He is defined as "one who holds himself out as being able to diagnose, treat, operate, or prescribe for any human disease, pain, injury, deformity, or physical condition, and who shall offer or undertake, by any means or method to diagnose, treat, operate, or prescribe for any human disease, pain, injury, deformity, or physical condition." Individuals who are permitted to practise must fulfil certain qualifications as prescribed by law. It is obvious that no doctor can give permission for any other person to practise medicine, hence, no doctor can permit a nurse to diagnose, treat, prescribe, or operate. He can permit her to carry out some functions in his absence but must assume full responsibility. There is a definite difference between writing a specific order for a given patient and a standing order for a given condition which a nurse can presumably recognize before the doctor sees the patient. When a nurse carries out an order after the doctor has seen the patient, diagnosed the condition, and prescribed treatment, she is not practising medicine. If she must diagnose and treat then she is practising medicine although she may be following a standing order.

There is no record in New York State of any suit against an industrial nurse for practising medicine with or without standing orders. Legal counsel on this point advises that both the doctor and nurse would be considered responsible if she carried out an order signed by him which could be construed as practising medicine. It is presumed that the nurse knows her limitations, and should refuse to carry out an order beyond her capacities. The law assumes that if the procedure carried out in some cases was within allowable nursing techniques the court would not consider her completely

guilty. It is interesting to note one case in which a nurse was considered practising medicine, who, under direct and personal supervision of a physician, incised the skin in order to enter a vein for a venoclysis. This was considered beyond the scope of nursing.

Every injury in a plant requires first aid treatment, and since the registered nurse is trained to recognize cause and effect of diseases, she is able to take certain measures which are not known to the laymen. For instance, she is trained to care for drugs and to measure dosage accurately, to know the toxicologic effects, and if in an emergency she used these drugs properly it would not be interpreted as the practice of medicine. Legal opinion varies but most lawyers agree that in a serious injury such as a compound fracture, the nurse who gives morphine as an emergency measure before the doctor arrives would not be considered guilty of practising medicine.

To understand the real function of standing orders it is necessary to differentiate clearly between a standing order for treatment as opposed to the so-called standing orders on procedure. The Council of Industrial Health of the American Medical Association, while calling their bulletin "Standing Orders for Nurses," actually promulgated a guide for nursing procedure on injuries and illnesses that may occur within a plant. Such guides on procedures very properly can be issued by medical organizations interested in the field. Real standing orders, however, refer to the treatment of specific patients and can be written only by a doctor who is actively and personally in charge of a dispensary and has the opportunity to see the patient. The "on-call" doctor who is not given direct responsibility for treatment of the cases cannot write valid standing orders but can approve a guide to procedure. The nurse in industry cannot use standing orders from



such a doctor as a substitute for personal medical attention.

Standing orders are meaningful and exercise their true function only when they represent medical supervision in the doctor's absence. Standing orders are not a substitute for medical care and cannot replace the doctor in industry. The practice of industrial medicine will benefit when management, the industrial physician, and the industrial nurse recognize this fact.

## BIBLIOGRAPHY

1. *Preventive Medicine in Modern Practice*. New York: Hoeber, 1942, 777 pp.
2. *Suggestions for the Guidance of the Nurse in Industry*. Wisconsin State Medical Society, 1932.
3. Standing Orders for Nurses in Industry. Council of Industrial Health. *JAMA* 122: 1247-1249 (Aug. 28), 1943.
4. Nursing Practices in Industry. *Pub. Health. Bull.* 283. 44 pp.
5. Standing Orders, Editorial. *JAMA*, June 8, 1946.
6. *The Practice of Medicine*, McKinney, New York State Laws—Book 16, Part II, Section 1250.
7. *The Practice of Nursing*, McKinney, New York State Laws—Book 16, Part II, Section 1374.
8. *Workmen's Compensation Law. New York State*, Section 13B No. 16.

# Use of Body Measurements in the School Health Program

## Part III. Supplementary Note Supplying Measurement and Rating Equivalents for Thickness of Skin and Subcutaneous Tissue below Left Scapula and above Left Ilium

HOWARD V. MEREDITH, PH.D., AND  
HAROLD C. STUART, M.D., F.A.P.H.A.

*Iowa Child Welfare Research Station, University of Iowa, Iowa City; and  
Department of Maternal and Child Health, Harvard School of  
Public Health, Harvard University, Boston, Mass.*

IN Part I of this article<sup>1</sup> the writers recommended that in school health examinations "as a minimum routine of anthropometry seven determinations be made" (p. 1369). The determinations proposed included five measurements (body weight, standing height, chest circumference, hip width, and leg girth) and two ratings (clinical appraisal of amount of subcutaneous tissue in two regions—"slightly below and a little lateral to the inferior angle of the left scapula" and "immediately above the crest of the left ilium" p. 1375).

Part II of the article (p. 1373) discussed specific procedures to be followed and illustrated interpretation of results. It was proposed that the two ratings of subcutaneous tissue be made using a five category scale and employing the symbols +, ++, +++, ++++, +++++.

In deciding whether to recommend ratings or measurements of the quantity of subcutaneous tissue, the writers faced a difficult choice. The advantages of "reliable measurement" were recognized and cognizance was taken of the fact that "a special spring calipers was available for measuring the thickness of folds of skin and subcutaneous tissue." On the other hand, it was apparent that most school physicians are experienced in making subjective ratings of fatty

tissue, while few are proficient in its measurement. We were agreed that "it would not lead to desirable results" to recommend the use of the available instrument "unless the school physician and his assistants were willing to take sufficient time to become skilled in its application" (p. 1369). Our general recommendation was that the quantity of subcutaneous tissue be appraised using the rating approach.

In making this recommendation we did not minimize the fact that the assignment of valid ratings "presupposes a background of information and experience" (p. 1375). It was emphasized that competence as a rater presumes the knowledge that the thickness of the subcutaneous tissue below the scapula and above the ilium "tends to increase with age during the school years and to be greater at any given age in females than in males. It further assumes considerable clinical experience in making judgments of subcutaneous tissue in these areas—experience affording a working familiarity with the range of individual differences found in given age-sex groups" (p. 1375).

The need has arisen for publication of measurement equivalents for ratings +, ++, +++, ++++, +++++. It is to meet this need that Part III has been prepared.

outline precautions that should be taken by certain persons for whom the usual cleaning agents might not be suitable. The *Industrial Hygiene Newsletter* is published by the U. S. Public Health Service, Washington, D. C.

#### NEW YORK STATE CEREBRAL PALSY

##### COMMISSION REPORTS

The year-old New York State Legislative Cerebral Palsy Commission recently made a preliminary report to the Department of Health carries over 4,600 such cases on its registers, that another thousand are under the care of the Department of Mental Hygiene, and that approximately one-third of all children in special classes in public schools are victims of cerebral palsy.

At present, although there is no known cure for those who have normal mentality (65 to 75 per cent of all), "there is perhaps no other group for whom rehabilitation to even a slight degree makes so much difference and is so important." The Commission has reached the following conclusions:

1. State care of cerebral palsy victims is inadequate and insufficient although its responsibility for this group is the same as for other disabled groups.
2. Specialized diagnostic and treatment centers should be available at an early age for every child afflicted.
3. Educational, medical, and therapeutic services should be expanded and integrated.
4. Inpatient care should be provided for those in need of such care.
5. At least one model center for diagnosis, treatment, and research should be established as soon as possible.
6. Specialized training for physicians, nurses, and teachers for this field should be stimulated.
7. The present formulae for state and federal assistance for the care of such cases should be restudied.

The first model center to be established will probably be at LeRoy, N. Y., on a fifty acre estate offered to the University of Rochester for that

purpose by Mr. and Mrs. Ernest L. Woodward. Operational costs for treatment services would be supplied by the state, and research and training would be conducted by the university's medical school, Strong Memorial Hospital staff, the National Foundation for Infantile Paralysis, and other groups.

##### ATOMIC RADIATIONS UNIT FORMED

Dr. J. G. Townsend, Chief of the Industrial Hygiene Division, U. S. Public Health Service, recently announced the formation of an Atomic Radiations Unit in the Chemical Section of the Division. Mr. Duncan Holaday, Engineer (R), is in charge of the new Unit. In making announcement of this new activity, Dr. Townsend expressed the belief that many institutions and industries have been handicapped in their use of radioactive isotopes and high energy machines because of their lack of information about the safe handling of dangerous quantities of radioactive materials. The new Atomic Radiations Unit, working through industrial units in the states, will help institutions and industries evaluate their hazards and establish safe working conditions.

LANSSING-INGHAM COUNTY HEALTH UNIT  
The City of Lansing and the County of Ingham in Michigan became a consolidated county health unit on July 1. Its director is Roelof Lanting, M.D., who previously served as Lansing City Health Officer. The combined population (1940) of the city and county is about 130,000.

##### ON REHABILITATION. DR. KESSLER HEADS NATIONAL COUNCIL

The election of Henry H. Kessler, M.D., as President of the National Council on Rehabilitation (1790 Broadway, New York 19) was recently announced. Dr. Kessler is Chairman of the Council on Industrial Health of the American

university faculty); 35 per cent business proprietors, managers, or skilled trade employees; 15 per cent farmers; and the remaining 10 per cent clerks, carriers, or semi-skilled laborers. The only rejections were rare instances of gross physical pathology" (p. 1384).

Thickness of skin and subcutaneous tissue was measured (1) in the region slightly below and a little lateral to the inferior angle of the left scapula, and (2) in the region immediately above the crest of the left ilium. In each instance, the method employed was that of so placing the measurer's left hand that its palmar surface faced the region of measurement and its first two digits were (a) in an opposable relationship, (b) directed caudally, (c) separated by a distance of approximately 30 to 40 mm., and (d) in contact with the subject's epidermis. The two digits (thumb

and index finger) were then moved directly toward each other in such a manner that a *complete double layer* of the subject's skin and subcutaneous tissue was elevated between them. This elevated fold was held with sufficient firmness to keep its two layers in contact, and the instrument applied to it with the right hand. The flat, blunt-nosed branches of the instrument gripped the fold at the site immediately distal to the tips of the thumb and index finger of the measurer's left hand. After reading off the thickness recorded on the instrument scale, (a) the instrument was removed and (b) the fold slowly released.

Measurements were made on the nude trunk. The objective of the measurer was to draw together a complete double layer of skin and subcutaneous tissue without including any of the underlying

TABLE 2

Measurement and Rating Equivalents for Thickness of Skin and Subcutaneous Tissue Below Left Scapula. Readings on Franzen-type Calipers Are Presented to Correspond With Ratings of +, ++, +++, +++++, ++++++

Age (Yrs.)	+	++	+++	++++	+++++
Boys					
4	10-11	12	13-14	15	16 and up
5	10-11	12	13-14	15	16 and up
6	10-11	12	13-14	15	16 and up
7	10-11	12	13-14	15	16 and up
8	10-11	12	13-14	15-16	17 and up
9	10-11	12	13-14	15-16	17 and up
10	10-11	12	13-14	15-16	17 and up
11	10-11	12	13-14	15-16	17 and up
12	11-12	13	14-15	15-17	18 and up
13	11-12	13	14-15	16-18	19 and up
14	11-12	13	14-15	16-18	19 and up
15	11-12	13	14-15	16-18	19 and up
16	12-13	14	14-15	16-18	19 and up
17	12-13	14	15-16	17-18	19 and up
18	12-13	14	15-16	17-18	19 and up
	12-14	15	15-16	17-18	19 and up
			16-17	18-19	20 and up
Girls					
4					
5	11-12	13	14-15	16-17	18 and up
6	11-12	13	14-15	16-17	18 and up
7	11-12	13	14-15	16-17	18 and up
8	11-12	13	14-15	16-17	18 and up
9	11-12	13	14-15	16-18	19 and up
10	11-12	13	14-16	17-19	20 and up
11	11-12	13-14	15-17	18-20	21 and up
12	11-13	13-14	15-17	18-21	22 and up
13	11-13	14-15	16-18	19-22	23 and up
14	12-14	14-15	16-18	19-22	23 and up
15	12-14	15-16	17-19	20-23	24 and up
16	13-15	15-16	17-20	21-24	25 and up
17	14-15	16-17	18-21	22-25	26 and up
18	15-16	17-18	18-21	22-26	27 and up
	15-16	17-18	19-22	23-27	28 and up
		17-18	19-22	23-27	28 and up

muscle tissue. Always one or two trial folds were taken in order to adapt the interdigital distance to the firmness and amount of subcutaneous tissue of the individual subject. During measurement, there was constant alertness to see that none of the subcutaneous tissue slipped from between the digits or the branches of the instrument. In the case of the supra-iliac measurement, the calipers were applied approximately 20 mm. superior to the crest of the left ilium in a line vertical with the left axilla. For the measurement on the back of the thorax, the calipers were applied approximately at the intersection of a transverse plane passing through the xiphoid cartilage and a sagittal plane lying midway between the sternum and the lateral wall of the thorax.

The assignment of measurement values to rating categories was made as follows: the lowest 10 per cent of the values for a given age and sex were assigned to category +, the next 20 per cent to category ++, the middle 40 per cent to category +++, the next 20 per cent to category ++++, and the highest 10 per cent to category +++++. Tables 1 and 2 present the results.

Although no further explanation of Tables 1 and 2 is essential, a few statements directly referring the reader to them may serve to elucidate their construction and facilitate their use. Table 1 shows that of the boys age 6 on whom supra-iliac measurements were obtained, 10 per cent gave readings on the Franzen-type spring calipers of 10 or 11, 20 per cent readings of 12 or 13, 40 per cent readings of 14 or 15, 20 per cent

readings of 16, 17, or 18, and 10 per cent readings of 19 or higher.\* Girls age 6 will be seen to yield systematically larger readings; for example, while readings of 14 and 15 are "average" records on the boys they are "below average" records on the girls. In terms of rating assignments, given a boy and girl age 6 each with tissue thickness readings of 14, the boy falls in category +++ and the girl in category ++. For tissue thickness readings of 17, rather than 14, the category allocations are +++ in the case of a girl and ++++ on a boy.

Table 2 exhibits the same general age trends and sex relationships as Table 1. Note, for instance, that boys falling in category ++++ at age 5 have the same tissue thickness as girls falling in category +++ at age 5, in category ++ at age 11, and in category + after age 15. Similarly, girls falling in category ++ at ages 15 and 16 have the same tissue thickness as boys falling in category ++++ at age 4, in category ++++ at age 11, and in category +++ at age 18.

Summarizing, this publication constitutes a supplementary note to "Use of Body Measurements in the School Health Program."<sup>1</sup> It provides school health workers with measurement and rating equivalents for thickness of skin and subcutaneous tissue in two regions—above the ilium and below the scapula. Tables of equivalents for normative use are presented on each sex covering the age period 4 to 18 years. The data utilized in constructing the tables were collected 1930–1945 on Iowa City children of northwest European ancestry attending the University of Iowa experimental schools.

#### REFERENCE

1. Stuart, Harold C., M.D., and Meredith, Howard V., Ph.D. *Use of Body Measurements in the School Health Program. Part I. General Considerations and the Selection of Measurements. Part II. Methods to Be Followed in Taking and Interpreting Measurements and Norms to Be Used.* *A.J.P.H.*, 36, 12:1365–1386 (Dec.), 1946.

\* For the benefit of those interested in the absolute thickness of skin and subcutaneous tissue during childhood and adolescence, it should be stated that these readings are not in millimeters. In order to obtain the millimeter thickness of a single layer of measured tissue one must first subtract 6 and then divide by 2. Hence, a calipers reading of 10 corresponds to a single layer thickness of 2 mm., a reading of 20 to a single layer thickness of 7 mm., and a reading of 30 to a single layer of thickness of 12 mm.

# Simplified Procedure for the Collection of Basic Data for Dental Program Planning and Appraisal\*

JOHN W. KNUTSON, D.D.S., DR.P.H., F.A.P.H.A.

*Senior Dental Surgeon, Chief, Dental Section, State Relations Division,  
U. S. Public Health Service, Washington, D. C.*

AT no time in the brief history of this organization has the outlook been as encouraging as it is today for the effective application of procedures for controlling the hazards to dental health. Some of the developments and activities which provide the basis for this optimism are:

1. Demonstrations now in progress which hold great promise for the early development of positive methods of preventing specific dental diseases.
2. Widespread endorsement by members of the dental profession of a program to increase dental research facilities and activities, to facilitate education of the public in matters relating to dental health, and to make dental health services available to all.
3. The initiation and sponsorship of legislation which would provide specific financial support for a broader program of research, education, and service.
4. Current dental surveys containing specific provisions for the collection of basic data for community program planning, their use heretofore having been largely limited to epidemiological studies on dental diseases.

To all of us who participate in this increased activity will come greater opportunities for service and heightened enthusiasm in our work program. With these opportunities also will come, to the dental profession and to us as individuals, correspondingly greater re-

sponsibilities. Each increase in public investment for improved dental health, whether in the form of coöperative endeavor, financial support, or both, will enlarge our obligation to provide objective evaluations of our performances.

Increased support of dental health programs—research, education, prevention, and treatment—will be given on the promise of dividends in dental health. Our advance estimates of those dividends may be based on factual information regarding proven control procedures or largely on presumptive evidence. Support based on the latter type of evidence is exemplified by the current willingness of large population groups to finance the artificial fluorination of public water supplies. Although all available data sustain the premise that fluorinated water will reduce the incidence of dental caries, this working hypothesis has not been verified. Yet six cities in this country are now adding fluorine to their water supplies, several cities have formulated concrete plans for fluorination, and numerous others are considering the feasibility of doing likewise.

Thus, it is clear that opportunities to apply methods for improving dental health—methods based on fact or on theory, or both—will increase with expanded support of dental health programs. It is not our intention here to

\* Presented before the Dental Health Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 12, 1946.

TABLE 1

Number of Decayed, Missing, and Filled Permanent Teeth and Per cent of Children with One or More DMF\* Permanent Teeth, by Age, for 6,257 Hagerstown, Maryland, Children (White), 2,627 Nicollet County Children (White), and 1,272 Baltimore, Maryland, Children (Negro)<sup>3,4</sup>

	Age Last Birthday													
	6	7	8	9	10	11	12	13	14	15	16	17	18	
<i>Hagerstown, Maryland, Children (White)</i>														
Number of children	327	403	487	493	529	531	596	565	695	651	445	355	148	
Carious, to be filled (D) †	81	259	454	706	819	920	1,250	1,402	2,124	2,037	1,302	829	368	
Missing, extracted or extraction indicated (M)	1	11	25	90	156	163	275	375	572	698	537	503	297	
Filled (F)	13	25	110	213	347	455	684	826	1,296	1,692	1,455	1,479	652	
DMF * Teeth	95	293	583	904	1,329	1,510	2,179	2,573	3,907	4,322	3,193	2,743	1,290	
DMF Teeth per person	0.29	0.73	1.20	2.02	2.51	2.84	3.66	4.55	5.62	6.64	7.18	7.73	8.72	
Per cent of children with one or more DMF Teeth	15.9	36.2	53.4	70.6	78.3	81.9	87.8	90.8	95.3	96.5	100.0	94.3	95.1	
<i>Nicollet County Children (White)</i>														
Number of children	259	252	276	282	276	265	289	231	159	142	93	79	24	
Carious, to be filled (D) †	113	258	368	443	468	524	673	621	407	431	206	171	56	
Missing, extracted or extraction indicated (M)	1	2	16	20	29	50	111	74	87	116	95	87	26	
Filled (F)	20	112	274	373	489	599	891	828	786	863	604	623	197	
DMF * Teeth	113	360	636	805	937	1,103	1,589	1,459	1,223	1,366	891	856	269	
DMF Teeth per person	0.51	1.43	2.30	2.86	3.39	4.16	5.50	6.32	7.69	9.62	9.58	10.84	11.21	
Per cent of children with one or more DMF Teeth	24.3	53.6	75.7	84.0	86.2	89.8	92.7	95.2	94.3	98.6	97.8	93.7	100.0	
<i>Baltimore, Maryland, Children (Negro)</i>														
Number of children	164	199	233	240	213	138	85	....	....	....	....	....	....	
Carious, to be filled (D) †	41	112	201	303	311	221	164	....	....	....	....	....	....	
Missing, extracted or extraction indicated (M)	1	2	6	19	34	20	24	....	....	....	....	....	....	
Filled (F)	0	3	12	10	10	9	5	....	....	....	....	....	....	
DMF * Teeth	42	117	217	331	352	248	190	....	....	....	....	....	....	
DMF Teeth per person	0.26	0.59	0.93	1.38	1.65	1.80	2.24	....	....	....	....	....	....	
Per cent of children with one or more DMF Teeth	14.6	34.2	48.5	57.9	66.2	68.1	72.9	....	....	....	....	....	....	

\* Decayed, missing, or filled teeth. A tooth both decayed and filled is counted as one DMF tooth.

† All teeth with one or more untreated carious areas except those teeth indicated for extraction.

discourage the utilization of such opportunities to test out on a field trial basis the methods which are unproved. Rather, it is our purpose to urge that all methods and the results of their application be subjected to periodic appraisal.

The workshop technique and the problem-solving approach are terms used today more or less synonymously with program planning. They are founded on the principle that "no health department, state or local, can effectively control disease without knowledge of when, where, and under what conditions cases are occurring."<sup>1</sup> Such knowledge is a prerequisite of effective program planning.

In collecting information on the nature and extent of the dental health problems of a community, answers to specific and pertinent questions are

sought. How prevalent are dental diseases? What are the objective consequences of such diseases? What can be done to control them? What are the community resources for sustaining an effective control program? How can those resources be supplemented and increased in effectiveness? What will the program cost? How can the proposed program be evaluated? Although program evaluation is last on this list of subjects for consideration, there is good reason to believe that it should receive first attention. Just as writing the conclusion of a paper provides direction and purpose to the writing of the body and introduction of the paper, so a definition of the methods to be used in the evaluation or appraisal of a dental program will provide direction and purpose to program planning.

The objective of any program for the

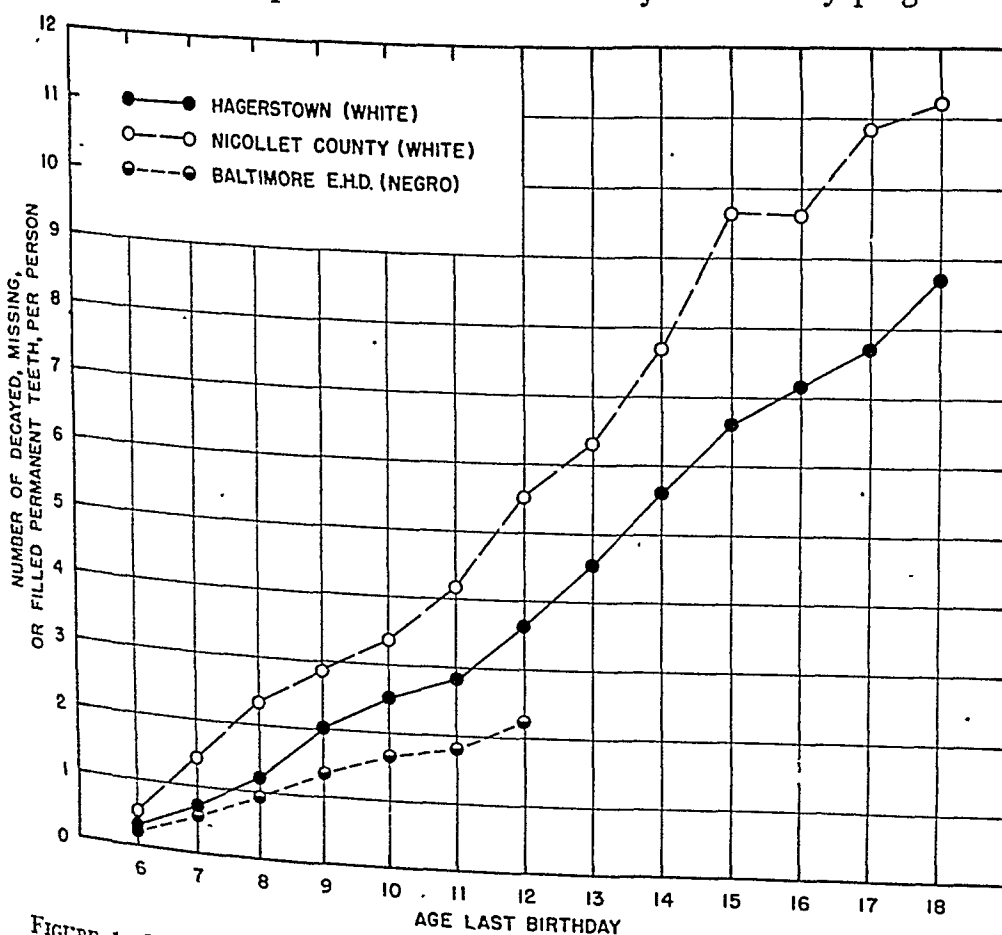


FIGURE 1—Number of Decayed, Missing or Filled (DMF) Permanent Teeth per Person, by Age, for 6,257 Hagerstown, Md., White Children, 2,627 Nicollet County, Minnesota, White Children, and 1,272 Baltimore, Md., Negro Children



control of a specific disease is the elimination or reduction of the consequences of the disease such as illness, disability, or death. Control may be accomplished through the application of preventive or treatment methods. The first of these may be used to eliminate the consequence of the disease through the prevention of its occurrence, whereas the latter may be used to lessen or mitigate the disease or to interrupt its course. Whichever method is used it is essential, in both the planning and the appraisal of the control program, that the prevalence of the disease and its consequences be known.

The prevalence of dental caries, for example, may be measured for the permanent teeth in terms of the average number of decayed, missing, or filled teeth per person, by age. This unit of measurement is adequate for all practical purposes for the age groups 6

through 30 or 35 years, since dental caries is the major cause of loss of permanent teeth during this age span.

Numerous dental surveys have demonstrated that the prevalence of dental caries varies greatly from community to community as well as racially.<sup>2,3,4</sup> An example of this variation is illustrated in Figure 1 (Table 1). The average number of DMF permanent teeth per child for Nicollet County, Minnesota, white children increases from 0.5 at 6 years of age to 5.5 at 12 years of age and to 11.0 at the age of 18 years; for Hagerstown, Md., white children, the increase is from 0.3 at the age of 6 years to 3.7 at age 12, and to slightly less than 9.0 at age 18. On the other hand, Negro children of Baltimore show an increase from 0.2 at age 6 to slightly more than 2.0 DMF teeth at age 12, the oldest age for which data are available on this last group of children.

It should be noted that the age-specific prevalence of dental caries for each of the three groups of children increases yearly in a straight line manner. Thus the yearly incidence of dental caries can be readily calculated. For Nicollet County white children the incidence would be  $11/12$  of a DMF tooth per child per year, for Hagerstown white children  $3/4$  of a DMF tooth, and for Baltimore Negro children  $1/3$  of a DMF tooth.

Another measure of the prevalence of dental caries in permanent teeth of the children of a community is the proportion of children having the disease by age. An illustration of the character of such information and the differences among the three groups of children previously referred to is presented in Figure 2. It will be noted that beginning with age 6 years the percentage of children having dental caries in permanent teeth increases with age and the rate of increase is different for each of the population groups. At age 12 years, for example, the percentage of children

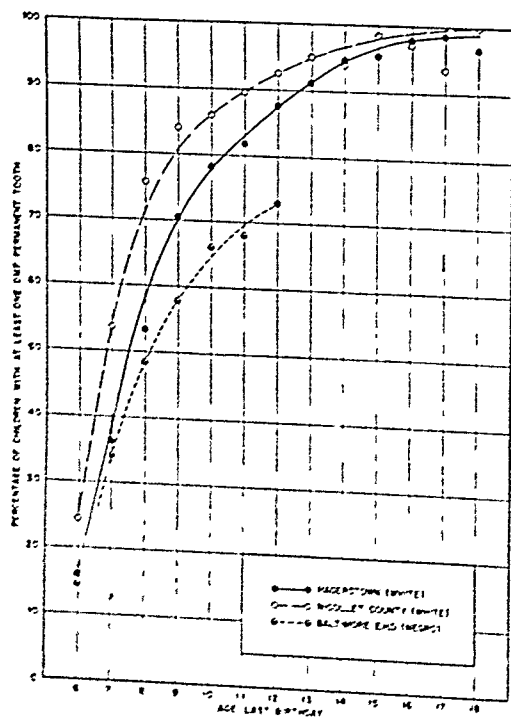


FIGURE 2—Percentage of Children with at Least One DMF (Decayed, Missing or Filled) Permanent Tooth, by Age, for 6,257 Hagerstown, Md., White Children, 2,627 Nicollet County, Minnesota, White Children and 1,272 Baltimore, Md., Negro Children

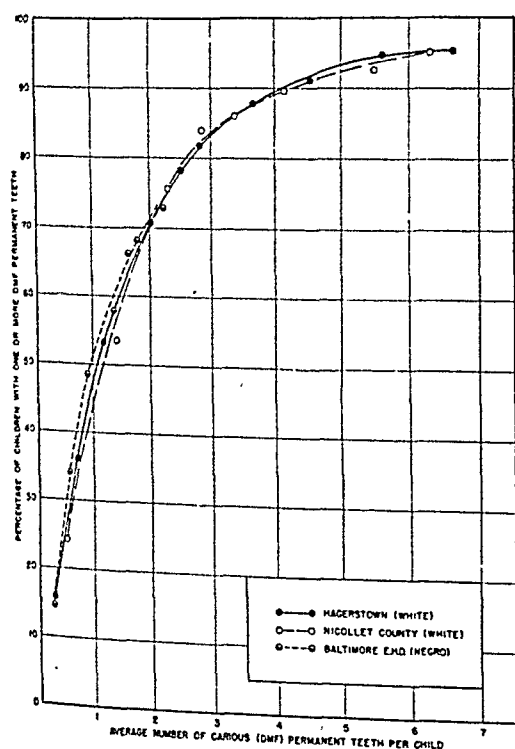


FIGURE 3—Relationship of the Per cent of Children with One or More DMF (Decayed, Missing or Filled) Permanent Teeth to the Average Number of DMF Permanent Teeth per child (Paired Age Values), for 5,277 Hagerstown, Md., Children (White), 2,289 Nicollet County, Minnesota (White), and 1,272 Baltimore, Md., Children (Negro)

having caries experience is 93 for Nicollet County whites, 87 for Hagerstown whites, and only 73 for Baltimore Negroes.

Thus it is evident from Figures 1 and 2 that both the percentage of children in a community who have dental caries and the average number of affected teeth per child vary from community to community and that they vary in the same direction. This latter observation led to a study of the relationship of these two measurements to each other and the results of that study are indicated in Figure 3. A common curve from a plot on arithmetic graph paper, of the paired values, percentage of children having caries, and average number of DMF permanent teeth per child, by age, for each group of children. This curve is of the catalytic type (Figure 4) and is described by the

equation  $97 - y = 97 (0.524)^x$ . A discussion of the formulation, validity, and use of the curve has been presented previously.<sup>4</sup> It is of considerable importance that the establishment of a standard curvilinear relationship between the two variables permits accurate estimates of the average number of carious permanent teeth per child from observed proportions of children with one or more decayed permanent teeth.

One of the consequences of untreated dental caries is tooth loss. The manner in which this finding varies among the groups of children discussed here is presented in Figure 5. It will be noted that the tooth mortality rate for individuals aged 18 years is two per child for Hagerstown whites, and slightly more than one per child for Nicollet County white children. In view of the previous determination of a higher caries prevalence among Nicollet County

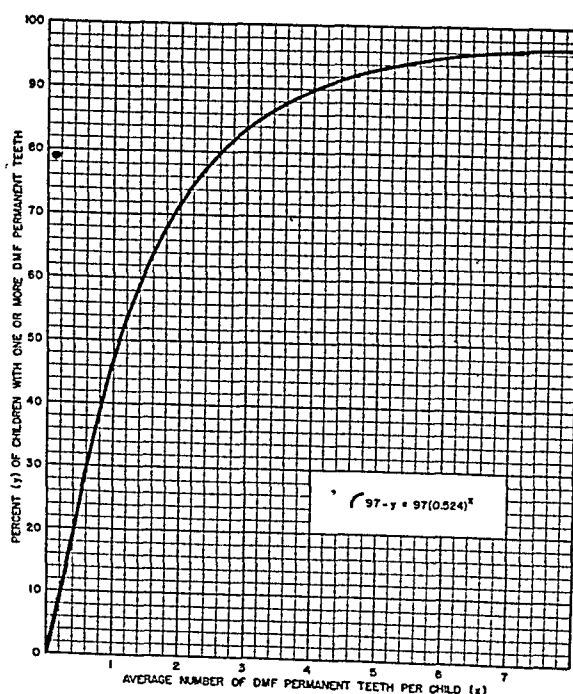


FIGURE 4—A Graph for Estimating the Average Number of DMF Permanent Teeth per Child from the Determined Percentage of Children, by Age, Showing Evidence of at Least One DMF (Decayed, Missing or Filled) Permanent Tooth

The Welfare Foods Service is concerned with mothers and with children under 5 years of age. As soon as a woman knows she is pregnant she draws a ration book for her unborn child, on presentation of a certificate from a doctor, a midwife, or a public health nurse. She is then entitled to 7 pints of milk a week at less than one-third the market price, or free if she cannot afford to pay. She may also obtain free cod liver oil or vitamin A and D tablets and, for a small payment, a supply of concentrated orange juice. Additional eggs and meat are also allowed her. After the baby is born the mother and child between them may get as much as 14 pints of milk a week, together with vitamin supplements, until the child is a year old. After that the allowance is 7 pints of milk a week for the child till he is five years old and, of course, the normal vitamin supplements. Up to the age of 2 years the child may have national dried milk if it is preferred, as well as an extra allocation of eggs.

So far as milk is concerned the scheme has been about 100 per cent successful, but the "take up" of the orange juice, the cod liver oil, and the vitamin tablets has not been so satisfactory.

When the child reaches school age, i.e., 5 years, he loses the welfare foods but is entitled to the School Milk and Meals Service. He gets  $\frac{1}{3}$  pint of milk in school in the middle of the morning and another  $\frac{1}{3}$  pint in the afternoon if he wants it. Unfortunately the afternoon milk has had to be discontinued temporarily on account of shortage of supplies. In addition, between the ages of 5 and 18, he is entitled to  $\frac{1}{2}$  pint of milk at home every day at the full price. All school milk is now free—over 92 per cent of children in public and private schools are having it.

The school children's milk amounts to about 50 million gallons a year. If this is added to the welfare milk, the

total is 230 million gallons of free or cheap milk for mothers and children, representing about 40 per cent of all supplies.

School dinners in special school canteens are being rapidly extended. At present just over 50 per cent of children attending State-aided schools benefit, but it is intended as soon as may be to provide dinners free for all school children—just now a charge is made for the cost of the food only, roughly about 5d. a meal. Every effort has been made to provide dinners of the highest possible nutritional standard. Extra meat, fat, sugar, and skimmed milk powder have been allowed and the calorie value of the meal for the older children is about 1,000, for the younger 750.

A scheme of family allowances has been introduced in Britain; for each child except the first the parents receive a cash allowance of 5/- a week. There was a considerable demand for a bigger cash allowance but, rather than agree to this, Government decided to give additional benefits in kind by maintaining permanently the Welfare Foods Scheme and the School Milk and Meals Scheme.

5. *Fortification of food*—Margarine had vitamins A and D added to it in January, 1940, to bring its value up to that of summer butter. Later on the amount of vitamin D was increased. This vitamin was also added to national dried milk in 1945 as a safeguard against rickets. Flour has not been fortified. Instead, we have had a national loaf made of 80 to 85 per cent extraction flour, with some calcium added to neutralize the effects of phytic acid, which apparently interferes with the absorption of calcium and iron.

6. An educational campaign on a large scale was undertaken by Government—through the press, on the radio, on the movies, and by local leaflets and demonstrations—to tell the public about the foodstuffs available and how best to

## DENTAL SURVEY

COUNTY Nicollet SCHOOL District No 39 EXAMINER M. A. Jordan  
CITY Rural ADDRESS \_\_\_\_\_ DATE 4-24-46

[illegible]

FIGURE 6—Dental Survey Form for Recording Evidence of One or More DMF Permanent Teeth, Filled Permanent Teeth and Filled Deciduous Teeth; and for Recording Permanent Teeth Extracted or Indicated for Extraction

enrolled in the public and parochial schools of the 4 urban centers and 44 rural districts were completed by a dentist and a recorder in a two month period. When the children to be examined are readily available, however, approximately 100 such examinations can be performed in a day. Decoding and processing of the dental examination records required three clerk-months. The appraisal technique

The appraisal technic applied in the spring of 1946 was based essentially on information regarding the presence of one or more DMF permanent teeth, and tooth mortality. The former was recorded as plus or minus and the latter by noting teeth extracted and teeth indicated for extraction. Supplemental information not essential to the appraisal consisted of data on the presence or absence of one or more fillings in permanent and in primary teeth. The latter items were recorded as plus or

minus. The tongue blade only was used in making this appraisal survey. The record form used is reproduced in Figure 6. An examiner assisted by a recorder completed the inspections in the equivalent of 9 days. Processing of the data was completed in less than one clerk-week. It is of considerable interest that approximately 1,000 children can be inspected per day by a dentist using this simplified procedure if the children are readily available.

A comparison of the prevalence of dental caries in permanent teeth for the years 1940 and 1946 is presented in Figure 7 (Table 2). It will be noted that for children aged 6 through 11 years the percentages are consistently lower for 1946 than for 1940, but that they are quite similar for children aged 12 to 18 years. Since the mouth mirror and explorer were used in making the examinations in 1940, whereas the tongue

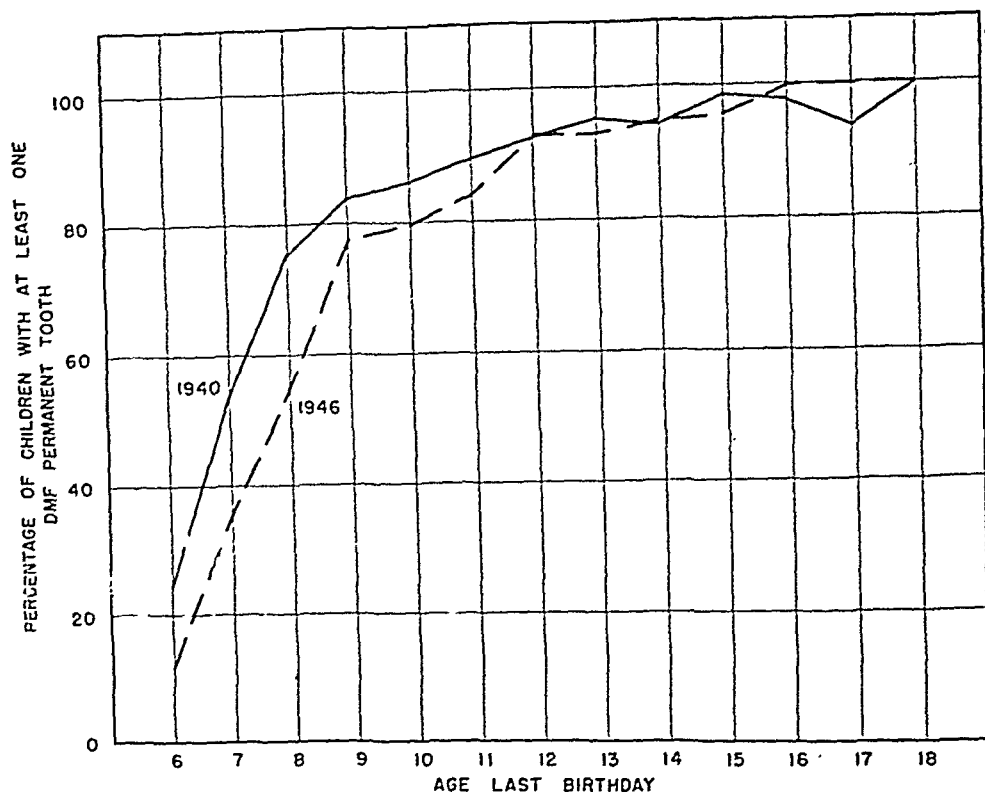


FIGURE 7—Percentage of Children with at Least One DMF (Decayed, Missing or Filled) Permanent Tooth, by Age, for 2,627 Nicollet County, Minnesota, School Children in 1940 and 2,310 in 1946

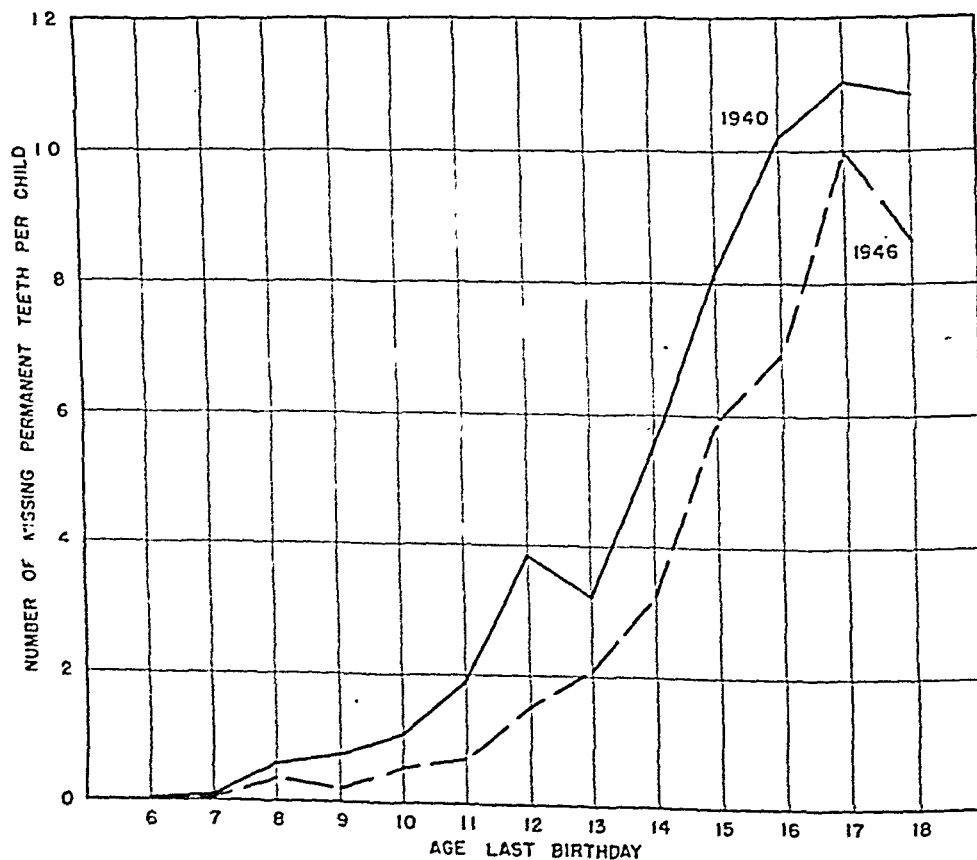


FIGURE 8—Tooth Mortality, by Age for 2,627 Nicollet County, Minnesota, School Children in 1940 and 2,310 in 1946

TABLE 2

Number of Children Examined, by Age, and Number and Percentages of Children Affected by Specified Dental Conditions, among 2,627 Children in 1940 and 2,310 in 1946, for Nicollet County, Minnesota <sup>10</sup>

		Age Last Birthday													
		6	7	8	9	10	11	12	13	14 *	15	16	17	18	
Age Distribution of Children															
1940	259	252	276	282	276	265	289	231	159	142	93	79	24		
1946	164	269	235	252	219	247	207	235	172	120	91	77	22		
Number of Children With at Least One DMF * Permanent Tooth															
1940	63	135	208	237	238	238	268	220	150	140	91	74	24		
1946	19	95	129	195	175	208	192	219	163	115	91	77	22		
Percentage of Children With at Least One DMF * Permanent Tooth															
1940	24.3	53.6	75.4	84.0	86.2	89.8	92.7	95.2	94.3	98.6	97.8	93.7	100.0		
1946	11.6	35.3	54.9	77.4	79.9	84.2	92.8	93.2	94.8	95.8	100.0	100.0	100.0		
Number of Missing † Permanent Teeth															
1940	1	2	16	20	29	50	111	74	87	116	95	87	26		
1946	0	1	9	5	12	17	31	49	64	71	63	77	19		
Number of Missing † Permanent Teeth, per Child															
1940	0.004	0.008	0.058	0.071	0.105	0.189	0.384	0.320	0.547	0.817	1.002	1.101	1.083		
1946	0.000	0.004	0.038	0.020	0.055	0.069	0.150	0.209	0.327	0.592	0.692	1.000	0.864		
Number of Children With at Least One Filled Permanent Tooth															
1940	10	43	101	129	154	161	200	166	118	115	84	72	22		
1946	10	83	117	182	160	202	180	213	159	110	88	76	21		
Percentage of Children With at Least One Filled Permanent Tooth															
1940	3.9	17.1	36.6	45.7	55.8	60.8	69.2	71.9	74.2	81.0	90.3	91.1	91.7		
1946	6.1	30.9	49.8	72.2	73.1	81.8	87.0	90.6	92.4	91.7	96.7	98.7	95.5		
Number of Children With at Least One Filled Deciduous Tooth															
1940	84	107	99	119	82	47	16	7	2	3	0	0	0		
1946	88	173	136	149	94	68	22	7	3	0	0	0	0		
Percentage of Children With at Least One Filled Deciduous Tooth															
1940	32.4	42.5	35.9	42.2	29.7	17.7	5.5	3.0	1.3	2.1	0.0	0.0	0.0		
1946	53.7	64.3	57.9	59.1	42.9	27.5	10.6	3.0	1.7	0.0	0.0	0.0	0.0		
* Decayed, missing															

\* Decayed, missing, or filled teeth. A tooth both decayed and filled is counted as one DMF tooth.

† Extracted teeth and teeth indicated for extraction.

blade only was used in making the inspections in 1946, it seems likely that the differences for children aged 6 to 11 years is a reflection of differences in technique rather than a true difference in caries experience. It is during the age span 6 to 11 years that the first objective evidence of caries in the permanent teeth appears in a relatively large proportion of children. On the other hand, the frequency of such evidence is much greater in children 12 to 18 years old. Comparison of the tooth mortality rates is presented in Figure 8. The rates are consistently lower for each age in 1946 than in 1940 and the overall reduction is approximately 30 per cent.

Information on the proportion of children having one or more filled permanent teeth is presented in Table 2. Roughly 20 per cent more children examined in 1946 had one or more fillings in permanent teeth than children examined in 1940. The relatively high filling experience in 1940 is noteworthy, however, since the findings for this year are used as the basis for demonstrating a further extension of dental service under the program.

According to the data presented in Table 2, a rather marked increase in the proportion of children with one or more filled deciduous teeth was accomplished through the dental program. For

the ages 6 to 12, approximately 50 per cent more children had fillings in deciduous teeth in 1946 than in 1940. It should be emphasized, however, that the information obtained and presented on dental fillings is not essential to basic program evaluation.

Neither program content nor volume of service should influence a clear-cut appraisal of how much control has been effected by a caries control program. For this limited purpose measurements of caries prevalence and tooth mortality are the basic essentials. Many other things of a routine bookkeeping nature must be considered in the complete evaluation of a dental program, such as administrative, educational, and service costs. These have meaning only, however, when related to the relative accomplishments of the program in terms of reduced consequences of dental disease.

## REFERENCES

1. Preface of Section "Prevalence of Disease" in *Pub. Health Rep.* U. S. Gov. Ptg. Office, Washington, D. C.
2. Messner, C. T., Gafafer, W. M., Cady, F. C., and Dean, H. T. Dental Survey of School Children Ages 6-14 Years Made in 1933-34 in Twenty-Six States. *Pub. Health Bull.* 226. 1936.
3. Klein, H., and Palmer, C. E. *On the Epidemiology of Dental Caries*. University of Pennsylvania Bicentennial Conference. Philadelphia: Univ. Penn. Press, 1941.
4. Knutson, J. W. An Index of the Prevalence of Dental Caries in School Children. *Pub. Health Rep.*, 59: 253-262 (Feb. 25), 1944.
5. Knutson, J. W. Appraising the Dental Health Program. *J. Am. Dent. A.*, 29: 543-556 (Apr.), 1942.
6. Wisan, J. M. Evaluating Dental Health Programs. *New York State Dent. Hyg. Quart.*, 7: 4-8 (July), 1937.
7. Knutson, J. W., and Klein, H. Studies on Dental Caries. IV. Tooth Mortality in Elementary School Children. *Pub. Health Rep.*, 53: 1021-1032 (June 24), 1938.
8. Dean, H. T., Arnold, F. A., Jr., and Elvove, E. Domestic Water and Dental Caries. V. Additional Studies of the Relation of Fluoride Domestic Waters to Dental Caries Experience in 4425 White Children, Age 12-14 Years, of Thirteen Cities in Four States. *Pub. Health Rep.*, 57: 1155-1179 (Aug. 7), 1942.
9. Arnold, F. A., Jr. Role of Fluorides in Preventive Dentistry. *J. Am. Dent. A.*, 30: 499-508 (Aug.), 1943.
10. Knutson, J. W., Maday, C., and Jordan, W. A. Simplified Appraisal of Dental Health Programs. *Pub. Health Rep.*, 62: 413-422.

# The Union Contract and Industrial Hygiene\*

BERNARD S. COLEMAN, F.A.P.H.A.

*Director, National Council of Jewish Tuberculosis Institutions, Denver, Colo.*

THE union contract, now more commonly known as "Union Agreement," is a mutual agreement between the union and the employer, and defines among other things the terms and conditions of employment. According to *Bulletin No. 686* of the U. S. Bureau of Labor Statistics,<sup>1</sup> issued in 1942, the number of union agreements at that time exceeded 50,000, and today in view of the impetus given to a better understanding of labor-management relationships by the activities of the late lamented War Labor Board, the number has been increased greatly.

Although the union agreement is regarded by some people as an anesthetic for the extraction of undue benefits from either management or labor, in reality, it represents an instrument for the better understanding by both parties of those elements or factors which make for sounder labor-management relations and for the improvement of conditions under which industrial practices may be expected to give the maximum results.

In recent years collective bargaining has played an important role in the development of group health insurance and sickness benefit programs. The U. S. Bureau of Labor Statistics reports<sup>2</sup> that "an increasing number of unions have succeeded in having health-benefit plans included in the terms of their agreements with employees, and

several international unions have established special facilities for helping their locals negotiate such plans. Although a number of the provisions in current agreements signify the substitution of contractual arrangements for already established employer-administered or union-administered benefit plans, many of them are new; some of the latter have been negotiated in lieu of wage increases which could not be obtained under the wartime wage stabilization program."

Group health insurance programs have been available in some companies for some time, but they were usually administered by the employer and could be altered or discontinued at the will of the company. It has been claimed that many were started merely to win employee loyalty and discourage union organization.<sup>2</sup> The motives for the establishment of these plans were continually under suspicion and as a result organized labor had never whole-heartedly endorsed them.

With the advent, however, of union participation in the plans to the extent of their inclusion in the union agreement, the attitude of labor on this score has changed considerably, and today we find health benefit programs, although for the greater part paid for entirely by industry, jointly administered by management and labor, or in some instances administered entirely by the union.

Examples are the union agreements initiated by the Amalgamated Clothing Workers and the United Retail, Whole-

\* Presented before the Industrial Hygiene Section of the American Public Health Association at the Twenty-fourth Annual Meeting in Cleveland, Ohio, November 13, 1946.



sale and Department Store Employees Unions which call upon the employers to pay a percentage of the payroll into the fund which, in turn, is administered jointly by the employers and the unions. The International Ladies Garment Workers Union and the Hat, Cap and Millinery Workers Unions administer the fund made available by a gross payroll tax contributed by the employers. The Textile Workers, CIO, fund is employer financed, and administered by insurance companies. The National Bituminous Wage Agreement, effective during the period of government operation of mines, provides a health and welfare program, the welfare and retirement fund being supported exclusively by the operators and managed by three trustees, one appointed by the Coal Mines Administrator, one appointed by the President of the United Mine Workers, and the third chosen by the other two. Furthermore, the trustees administer the medical and hospital fund accumulated from wage deductions authorized by the union.

It is true that in general greater emphasis is being placed on group health insurance and sickness benefit plans in collective bargaining than on basic industrial hygiene factors and principles. One of the most comprehensive series of clauses pertaining to health, safety, and medical care is that of the United Mine Workers, which clearly places industrial hygiene in as important a category as issues of wages and union security. In addition to their health and welfare program referred to above, "the Coal Mines Administrator undertakes to have made a comprehensive survey and study of the hospital and medical facilities, medical treatment, sanitary and housing conditions in the coal mining areas. The purpose of this survey will be to determine the character and scope of improvements which should be made to provide the mine workers of the nation with medical, housing, and

sanitary facilities conforming to recognized American standards."<sup>3</sup> Thus, the supervision of industrial hazards takes its proper place in the consideration of the health and welfare of the worker.

The rapid movement of demands by unions for health and welfare service from employers does not, in the true sense, actually involve industrial hygiene, according to Dr. Leo Price, Director of the Union Health Center, who stated: "As far as unions are concerned, emphasis has been shifted from industrial hygiene to social security and health service for workers. All the union contracts in the garment industry which have secured a payroll tax levy stipulate it should be spent for vacation benefits and health services such as medical care, sickness and hospitalization benefits and death benefits."<sup>4</sup>

Nevertheless, there is ample evidence of the increasing interest on the part of labor to include various industrial hygiene provisions in union agreements. A study<sup>5</sup> of union agreements in effect twenty years ago reveals various provisions relative to the safety and comfort of employees already existent at that time. Clauses called for suitable fire protection, the observation of sanitary codes, satisfactory sanitary arrangements, adequate dressing rooms, lockers, wash rooms, toilets, and cold drinking water. Some clauses called for cleanliness and sanitary conditions with sufficient heat, light, and ventilation. Suction devices were to be provided for dust-raising machines. The clauses, however, were all very meager and were but the beginning of more comprehensive clauses in later years.

The International Union of United Automobile, Aircraft and Agricultural Implement Workers of America (UAW-CIO) has issued a publication<sup>6</sup> containing sample clauses recommended for all local unions by the International Executive Board which are quite comprehensive. The recommendations call

for a health and safety committee consisting of company and union representatives. The duties of this committee are outlined specifically and if followed should make for a comprehensive industrial hygiene program. Furthermore, the agreement outlines the company's industrial hygiene responsibility to the effect primarily that the company shall "maintain sanitary, safe and healthful working conditions in the plant, to equip all hazardous machinery with effective safety devices, to maintain precautions against exposure which may cause occupational diseases or other symptoms, and to furnish and maintain without cost to the employee whatever equipment and clothing may be needed by them for the safe, healthful, and protective performance of their jobs." Provisions are made for the reporting of all industrial injuries, diseases, and absences due to illness to the health and safety committee, for the maintenance of the necessary medical facilities for the treatment of injured employees and the limitations to be placed on the services to be rendered by first aid men and nurses. The agreement specifies that physical examinations shall be made and the results be held confidential, and that such physical examinations "shall be used solely for the purpose of proper placement," and that any changes in the employee's position that may result from physical examination shall be referred to the health and safety committee for investigation.

The above requirements seem to be reasonable and logical. With mutual understanding of the importance of maintaining healthful working conditions for the protection and health of the worker, there is no question but that proper and adequate results can be obtained. At least it puts the company on notice that labor expects the conditions that industrial hygienists have been pleading for these many years. Ever so many

surveys indicate the relative infrequency of good industrial hygiene services. If those companies in which there are union agreements will write into the contract the industrial hygiene clauses that are recommended and the companies as well as the employees carry out the provisions, one of the greatest steps forward in industrial hygiene will have been taken.

Unfortunately the local union agreements are not generally as comprehensive as those recommended above, but there are sufficient numbers to indicate the development of an industrial hygiene consciousness on the part of management and labor.

Several union agreements that have been reviewed still make reference merely to adherence to legal requirements and thus dismiss the subject. Another type of agreement emphasizes cleanliness of toilets and wash rooms, while others state only that the company agrees to provide healthful working conditions. An aircraft company includes in its union agreement clauses on physical examinations, plant sanitation, exhaust ventilation, first aid, health and safety committees. In a shipbuilding agreement the industrial hygiene considerations are embodied in one clause, as follows:

"All toilets and washrooms shall be kept in a clean and sanitary condition, properly heated and ventilated, and suitable quarters with heat shall be provided for men to change clothes and eat their lunch. There shall be facilities for drying clothing; and all staging, walks, ladders, gang planks, and safety appliances shall be constructed in a safe and proper manner by competent mechanics. Proper lighting and ventilation shall be provided for all enclosed working spaces. The employer shall furnish suitable guards around welders for the protection of workmen's eyes. In case of spray painting, employer shall provide proper protection against fumes caused by paint spray. Prompt ambulance service and first aid to injured workmen shall be provided on all shifts, and a safety man shall be employed and made responsible for the

proper enforcement of safety rules. Suitable lockers, washrooms, and drinking water shall be furnished by the employer. There shall be no doctor's physical examination nor age limit, except as required by law. Unless required by law, no employee shall be compelled to pay hospital or insurance fees in the course of employment or as a condition to secure employment."

The safety director of a company, which has the following industrial hygiene clauses in its agreement with the union, feels that the reference to union recognition of the employees' duty to cooperate with the company in its safety and health program is "a great step forward in union and management cooperation in the health and safety of workers in an industrial plant":

"The Company recognizes its obligation under the law of the Local, State and Federal Governments, with reference to the health and safety of its employees, and shall continue to comply therewith. In the event such laws are inadequate to insure proper protection to its employees, the Company agrees to make every reasonable effort to eliminate all unsafe or unhealthy conditions. The Union recognizes the duty of the employees to cooperate with the Company in its safety and health program when approved by the Union."

"A joint safety committee composed of equal representatives of the Company and the Union shall investigate all accidents and take all necessary steps to prevent accidents."

"The Company will furnish all necessary equipment such as special gloves for handling hot metal, goggles, respirators and other such articles required by safety codes."

"All lavatory and wash room facilities will be kept clean and sanitary in addition to being provided with soap and adequate lockers."

The following agreement is a splendid example of effective industrial hygiene clauses which both labor and management have found to be highly beneficial, for the joint Safety Committee is interested in all phases of conditions relative to the working conditions, safety standards, and other conditions affecting the employees' health and well-being; furthermore, the committee is

well versed in the safety standards prescribed by the Department of Labor and Industries for the State, and is continually striving for the betterment of the safety conditions and welfare of the employees:

#### *Physical Examinations—*

"Every applicant for employment must pass a physical examination. If, by such examination the applicant is rejected for employment, he will be furnished with the doctor's report upon request. The applicant shall then have the privilege of having an examination by a qualified physician of his own choosing. If the two reports are contradictory, the Union may then take the matter through the regular grievance channels. The cost of examination by his own physician shall be paid by the applicant.

#### *Plant Safety Committee—*

"It is the desire of both parties to this agreement to maintain high standards of safety in the plants of the company in order to eliminate as far as possible industrial accidents and illnesses.

"Plant Safety Committees shall be appointed from employees at each of the Company's plants not exceeding four representing the Union and four representing the Company. The chairmanship of these committees shall be rotated between the Union and the Company members each quarter. The secretary shall be chosen from the opposite group to the chairman and shall keep minutes of all meetings.

"The duty of the Plant Safety Committees will be to see that all applicable state and municipal safety and sanitary regulations are complied with as well as to make recommendations for the maintenance of proper standards. These committees shall receive and investigate complaints regarding unsafe and unsanitary working conditions.

"The Company shall have available at all times in each shop, a supply of safety report forms, made up in quadruplicate for the use of shop committeemen and foremen to report any needed correction in the shop relative to safety conditions. One copy of this report will be sent to the chairman of the safety committee, one copy to the President of the Union, and one copy to the Company Safety Supervisor. The original copy of the report will remain in the shop files, which shall be available at all times to the shop committee. The Company safety supervisor will keep the above named persons informed in writing of

the progress, disposition and adjustment of each such safety report.

"Proper and modern safety devices shall be provided for all employees working on unsafe and hazardous work, such devices to be furnished by the Company, and it shall be mandatory for employees to use same.

#### *First Aid—*

"The Company at all times shall maintain on all shifts, in all plants, sufficient registered nurses and emergency first aid stations to care for employees in case of accidental injuries.

"The Company shall provide ambulance service for all shifts in all plants.

#### *Sanitation—*

"All toilets and wash rooms shall be kept in a clean and sanitary condition and suitable quarters with heat shall be provided for men to change clothes and their lunch. There shall be facilities for drying clothes, and all staging, walks, ladders, gang planks and safety appliances shall be constructed in a safe and proper manner by competent mechanics. Proper ventilation shall be provided and welders shall have guards around their work to protect workmen's eyes. Arrangements must be made to give prompt ambulance service and first-aid to injured workmen, and a safety man shall be provided on all shifts, if necessary, and made responsible for the proper enforcement of safety rules. The Business Representatives of the various crafts shall have access to the shops and yards at all times by applying for permission through the office, provided they do not interfere with or cause workmen to neglect their work. Shower baths shall be installed where tank and boiler cleaning work is done.

#### *Control of Hazards—*

"All equipment and processes that emit or create harmful dusts, fumes, vapors or gases in quantities, that create harmful exposure to employees exposed thereto and where the prevention, elimination, or control of said hazards by means of general ventilation alone are inadequate to furnish the required protection, shall be connected to an exhaust system for the removal of said hazards as far as practicable at their point of origin."

An industrialist in a personal communication recently stated: "In contract negotiations in recent years, the matter of so-called industrial hygiene or safety clauses has been discussed. In

view of the health maintenance program and the extensive safety program in existence in all our plants, and the record of performance which has been achieved as a result of these programs, our position in this respect is different from that which might be obtained in other industrial enterprises not having the same performance record.

"In the matter of industrial hygiene or accident prevention work, management, in the final analysis, is charged with the responsibility for the conditions which exist in an industrial enterprise. Accordingly, we believe that since the responsibility rests with management, the execution of such responsibility must also rest with management. On the other hand, this does not mean that we discourage interest on the part of our employees in making suggestions or taking an active part in making our plants safer and healthier places in which to work. In fact, the Company's Suggestion Plan provides a means whereby employees may receive financial reward for making suggestions for the improvement of safe working conditions."

Industrial medical services, including health and safety activities, have been for the greater part the sole responsibility of management until the last few years. There is fragmentary evidence of references to health and safety in union agreements in effect twenty years ago, but within the last two decades organized labor has taken an increased interest in industrial health services and if this movement takes on the anticipated impetus, management will be compelled to pay more attention to the environment in which the employee works. Everything points to a more consummate effort on the part of management to introduce and maintain the most modern medical services that are attainable.

Whether this will come as a result of the insistence of labor to include industrial hygiene clauses in the union agreement, whether it will come about by management's voluntary contribution, or whether it will result from

mutual coöperation between management and labor, is of relative significance, but that industrial management operations for effective production demand some such consideration is the crux of the development of adequate industrial medical services at all times in all industries.

Above all, industrial hygienists everywhere have a golden opportunity to enhance their field by enlisting the support of labor, and to this end the Union

Agreement can be an effective instrument.

REFERENCES

1. Union Agreement Provisions, *Bull. No. 686*, U. S. Dept. of Labor Statistics, Washington, D. C., 1942.
2. Health-Benefit Programs, Established through Collective Bargaining, 1945, *Bull. No. 841*, U. S. Dept. of Labor Statistics.
3. National Bituminous Wage Agreement, May 29, 1946.
4. Personal Communication, Dr. Leo Price, September 4, 1946.
5. Trade Agreements, 1927, *Bull. No. 468*, U. S. Dept. of Labor Statistics, 1928.
6. Sample Clauses from UAW-CIO Agreements, Research Dept., UAW-CIO, Detroit, Michigan, 1945.

Best Sellers in the Book Service for October

An Appraisal Method for Measuring the Quality of Housing: A Yardstick for Health Officers, Housing Officials and Planners.

Part I. Nature and Uses of the Method, 1945.....	\$1.00
Part II. Appraisal of Dwelling Conditions, 1947.....	5.00
The Control of Communicable Diseases, 6th ed., 1945.....	.35
Diagnostic Procedures and Reagents, 2nd ed., 1945.....	4.00
Food Poisoning. Dack, 1943.....	2.00
Hospital Care in the United States. Bachmeyer, 1947.....	4.50
Medicine in the Changing Order. N. Y. Academy of Medicine Committee on Medicine and the Changing Order, 1947.....	2.00
Milk and Food Sanitation Practice. Adams, 1947.....	3.25
Standard Methods for the Examination of Water & Sewage, 9th ed.. 1946.....	4.00

Order from the Book Service  
AMERICAN PUBLIC HEALTH ASSOCIATION

# Postcensal Population Data for Cities\*

HENRY S. SHRYOCK, JR., PH.D.

*U. S. Bureau of the Census, Washington, D. C.*

SINCE 1940 there have been spectacular rises in the numbers of marriages and births in the United States. Further gains have been made in death control, with unanticipated special progress in reducing the toll of certain diseases. Fifteen million men and women entered the armed forces, of whom only 1,300,000 now remain there. The growth of cities was affected not only by these factors, but also by a record amount of internal migration, on the part of both civilians and troops.

Amid all these changes, the vital statistician needs postcensal population figures more than ever. He wants to compute the birth, death, and marriage rates for his city during the war and post-war years. The public health administrator is interested in the size of the population he must serve and in its racial, personal, social, and economic characteristics. He wants to know what effects of the war upon urban populations are relatively permanent and to what extent pre-war levels and trends are being reestablished.

You are probably keenly aware that the Bureau of the Census does not have annual postcensal population estimates for all cities, even those above a certain size. It is unlikely to have such estimates in the near future. On the positive side, however, it should be said that the demographic changes of the

period since 1940 are far better chronicled than those of any previous period in American history except for the census years themselves. This is particularly true on the national level; but an unprecedentedly large amount of data have also been collected and published for states, counties, and cities. These gains are partly overshadowed by the very magnitude of the changes that have occurred and by the rapid growth in the public's demand for statistics.

Before summarizing the population data now available for cities, I should like to discuss briefly the possible population figures for an area. In a decennial federal census, the population shown for a state or city is essentially the *de jure* population, that is, the number of people whose usual residence is in the area. Members of the armed forces are counted where they are stationed. During the war there was an understandable desire on the part of a city to have its former residents absent in the armed forces counted as part of its population. For several reasons, such a procedure was impracticable. No one knew how many men inducted from the city had families there to report them. The total number of men entering the armed forces included some who had died or had already been discharged and settled elsewhere; some still in the service would die in the service or settle elsewhere upon their discharge. Therefore, the Census Bureau never counted such persons in local censuses or included them in estimates.

\* Presented before the Vital Statistics Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 14, 1946.

It was possible to include troops stationed in an area in the censuses and some of the estimates. The sum of the troops and the resident civilians does not constitute, however, the *de facto* population of the area. On the contrary, this sum is comparable with the decennial census figures, since civilians temporarily absent were included and those only visiting in the area were excluded.

Realistically, however, it was recognized that the troops stationed in a city were a very transitory part of its population. In many ways they were not the responsibility of the city government. Therefore, whenever security regulations permitted, they were shown separately. At other times, only the civilian population was enumerated or estimated. In computing birth rates for states, the National Office of Vital Statistics has used the resident civilian population as a base. In computing death rates, it has used the civilian population plus the troops stationed in the area.

At the request and expense of local governments, the Census Bureau has conducted about 250 special censuses since 1940. Most have been of cities, but others covered counties, minor civil divisions, or new annexations to a city. These censuses represent complete counts of the military and civilian populations in the area. The Bureau provides the supervisor (for whose services it is remunerated), schedules, and procedural instructions. It tabulates the data, certifies the figures as official, and publishes the results.<sup>1</sup>

Most local governments request only a cross-classification of their population by sex and race, but the larger ones usually are also interested in the distribution by age. If the city is tracted, the data are tabulated by census tracts. The number of occupied dwelling units, which is equivalent to the number of private households, is almost always ob-

tained. If the sponsoring government desires, the schedule will cover additional characteristics of population and housing.

Most of the cities that have sponsored special censuses have been in California, but there have been a fair number in other parts of the country. The larger places canvassed include Berkeley, Long Beach, Los Angeles, Oakland, Sacramento, San Diego, and San Francisco, Calif.; Beaumont and Port Arthur, Tex.; and Wilmington, N. C.

In 1944 the President's Commission on Congested Production Areas asked the Bureau to conduct sample censuses in the more important such areas. Those enumerated were: The Puget Sound, Portland-Vancouver, San Francisco Bay, Los Angeles, and San Diego areas on the West Coast; the Detroit-Willow Run and Muskegon areas in the Middle West; and the Hampton Roads, Charleston, S. C., and Mobile areas in the South. The total population of each area was obtained with a coefficient of variation of less than 1 per cent, i. e., 2 out of 3 times an estimated value should fall within 1 per cent of the complete count. Estimates of the total and civilian populations were published for 22 cities in these areas.<sup>2</sup> In addition to these resident populations, the population actually present on the census date (the *de facto* population) was shown.

Published data from these sample censuses covered a wide variety of characteristics. These included sex, race, age, marital status, and relationship to head of household; number, origin, and characteristics of immigrants; employment status; and characteristics of housing.

Chiefly on the basis of the number of registrations for ration books, estimates were made of the civilian population of counties as of May, 1942; March, 1943; and November, 1943.<sup>3</sup> By

now, station strength in a particular county on these dates is obtainable from the War and Navy Departments. This military population may be added if the total population is desired. Only a few cities coincide with these counties, it is true; but in the case of many of the larger cities, the county population provides a useful ceiling in the preparation of an estimate. For the last date, November, 1943, the estimated age and sex distribution was also published for 39 areas of intense war activity.<sup>4</sup>

Beginning in 1942, the Census Bureau, in coöperation with the National Housing Administration, has conducted numerous housing surveys in urban areas, on a sample basis. Of these, 250 have estimated the number of occupied and vacant private dwelling units in the city.<sup>5</sup> Tenure and persons per room are reported for the occupied dwelling units and habitability for the vacant ones. Similar studies have been conducted in a number of large cities by the Bureau of Labor Statistics. Urban surveys have been made to determine the housing intentions of veterans.<sup>6</sup> To date press releases for 113 areas have been published. Among other facts reported is whether the veteran lived in the area at the time of his entry into the armed forces, an item which indicates the extent of in-migration of veterans.

It may be of interest that wartime migrants, in general, have not returned in large numbers since V-J Day to their old homes. The centers of war production are tending to hold on to their gains, according to several surveys made by the Census Bureau. Furthermore, the volume of internal migration has continued to be large in the first year of peace. Many veterans are settling in new homes, and their destinations are similar to those chosen by civilian migrants during the war.

There are prospects for a fair number

of additional population estimates between now and 1950. In October, November, and December, 1946, sample surveys of the nature of the Census Bureau's *Monthly Report on the Labor Force* were taken in a number of local areas. Twenty-five cities and 8 metropolitan districts were covered. Although these surveys were designed primarily to obtain facts about the labor force, the total civilian population was also secured as a by-product. The sample was designed to secure such estimates with a coefficient of variation due to sampling error of 5 per cent.

In April, 1947, an expanded national survey of the labor force, population, and housing was undertaken. Special surveys were also taken in each of 35 metropolitan districts. Three releases have been published for each district: one on population, one on the labor force, and one on housing.<sup>7</sup> An estimate of the population of each metropolitan district is given in the first release. If funds are available, the rest of the 140 metropolitan districts will be covered during 1948 or 1949. These surveys will be similar to those taken in the fall of 1946 rather than to the April survey. It is hoped that estimates of population for cities may be published eventually on the basis of the sample surveys supplemented by independent contemporary data.

The Bureau would have conducted a national sample survey in October, 1946, had the necessary funds been appropriated by the Congress. In fact, funds for preparatory work on this sample were provided in the fiscal year 1946; and in the special census of Wilmington, N. C., taken in April, 1946, the schedule for a national sample census and some of the procedures were pre-tested. As a result of the preparatory schedule testing, and other preparatory work, the Bureau is prepared presently to conduct a national sample survey of population once funds are available.



Such a national sample would permit the publication of estimates with a coefficient of variation of about 1.5 per cent for all states and for all cities above a certain minimum size, say 150,000. The composition of the population of these states and cities would also be shown.

Finally, a word may be said about population censuses conducted by the states. Unfortunately, only a small fraction of the states that performed this function several decades ago do so nowadays. In the forties only Florida, Kansas, Massachusetts, and South Dakota have taken censuses. The coverage is on a complete, rather than a sample basis; and figures are published for all incorporated places. The quality of these enumerations varies, and all make a practice of trying to include persons living in the area at the time of their entry into the armed forces but living outside the area at the time of the census.

Meanwhile, the problem of current estimates of city population remains with us. Aside from the ration book registrations and sample surveys, no important new source of estimates has appeared during the forties. As the foregoing resume of available data indicates, however, one does not always need to go back to 1940 as a base date.

It has been often noted that local series sensitive to economic fluctuations are usually poor indices of population growth.<sup>8</sup> In this class, I should put the number of electric, gas, and water meters; the number of telephone subscribers; newspaper circulation; and bank clearings. Early in the war, these series often ran ahead of population growth because their increases reflected mainly the added prosperity of the inhabitants. Later in the war the reverse was often true, since the in-migrants could not get utilities because of shortages or had to double up with other families. Similarly, statistics on building

permits and demolitions; usually of moderate aid in making estimates of families, became of restricted use because shortages have limited the new construction needed to take care of the greater number of families in the city.

Where there is a good city directory, the number of listings of individuals may be used in estimating the adult population. The process is expensive and must be carried out carefully. For instance, suburban residents, wives listed separately as well as with their husbands, and business firms should be eliminated. A well designed sample will cut down the expense and give an estimate of the net listings within a determinable sampling error. The population of school age may be estimated from school enrollment statistics or a school census. All these series should be obtained for the base date as well as the estimate date so that the ratio between the series and the equivalent census age group may be established. Finally, children of preschool age may be estimated from resident births. The parts are added to get the estimate of the total population. Note that the post-censal source used does not have to represent a complete coverage of the age group concerned. It is necessary only that the source bear a fairly constant ratio to the population group or that this ratio vary in a predictable manner.

If a recent city directory is not available, one may use vital statistics and school data alone. The natural increase of the city population is first estimated from resident births and deaths. The school data may be used to gauge net migration. Get the ratio of elementary school enrollment or the local school census to a comparable age group in the 1940 census. Using survival rates derived from an appropriate life table, one may next compute the expected number of survivors from the 1940 census in this age group at the estimate date.\*

\* The number of children at ages below 5 in the 1940 census should be corrected for underenumeration.

This is the number expected had there been no migration. Using the 1940 ratio of the local school statistic to the federal census age group (or an extrapolated value of the ratio), translate this estimate into the expected school enrollment or school census at the estimate date. The difference between the expected and the actual number is an estimate of the net migration in or out for this age group. The simplest assumption is that the rate of net migration can be applied to the population of all ages. In some cases, other assumptions may be made on the basis of additional evidence. For example, it may seem better to assume that the net migration proportion was 50 per cent greater for the population of all ages.<sup>9</sup>

The number of men taken from the city's population into the armed forces through given dates should be obtainable from local selective service boards. It is possible that data on discharges may also be available locally; if not, a factor based on the nation's experience could be used to estimate net loss to the armed forces. The resulting estimate should be subtracted from the population at the base date as an additional step in getting the civilian population. If the total resident population in the city is desired, add the number of troops stationed there at the given postcensal date.

I have given above rough outlines of two types of methods of estimation. These outlines indicate the general approach and are not intended to serve as detailed directions for making a particular estimate. The complete methods would require several pages and even then would not take into account unique problems that might arise in particular cities.

The best population estimates for cities will not be obtained by applying a rigid formula to all cases. Local statisticians are in the best position to investigate the peculiarities in the symp-

tomatic data available for their cities. Some cities have sources that do not exist in others. The Bureau of the Census is now struggling with estimates of state population for July 1, 1947. At present it does not have the facilities to tackle the problem for cities. We should be happy, however, to correspond or consult with statisticians who are making serious attempts to produce estimates for their cities. Such discussions of investigation and experimentation should prove of mutual benefit in uncovering new sources of estimates and in improving methodology.

#### REFERENCES

1. See U. S. Bureau of the Census. Population Series P-SC. Special census of . . . , 1943 to date. Nos. 1 to 190, especially No. 183, which summarizes the series. The designation of this series has recently been changed to P-28.
2. U. S. Bureau of the Census. Population. Series CA-1, Nos. 1 to 11. . . . Congested Production Area. Apr. 18, 1944, to Sept. 20, 1944.  
     Population. Series CA-2, Nos. 1 to 10. Wartime changes in population and family characteristics. . . . Congested Production Area. July 7, 1944, to Oct. 18, 1944.  
     Population. Series CA-3, Nos. 1 to 10. Characteristics of the population, labor force, families, and housing. . . . Congested Production Area. July 20, 1944, to Oct. 7, 1944.
3. U. S. Bureau of the Census. Population. Series P-3, No. 33. Estimates of the Civilian Population by Counties: May 1, 1942. Feb. 25, 1943.  
     Population. Series P-3, No. 38. Estimates of the Civilian Population by Counties: March 1, 1943. Oct. 31, 1943.  
     Population. Series P-3, No. 40. Estimated Civilian Population of Metropolitan Counties, by Single Counties: March 1, 1943, and May 1, 1942. Jan. 7, 1944.  
     Population. Series P-44, No. 3. Estimated Civilian Population of the United States, by Counties: Nov. 1, 1943. Feb. 15, 1944.
4. U. S. Bureau of the Census. Population—Special Reports. Series P-44, No. 15. Estimated Civilian Population, by Age and Sex, for Selected Areas: Nov. 1, 1943. July 1, 1944.
5. U. S. Bureau of the Census. Series H-V. Nos. 1 to 250. Survey of Vacancies in Dwelling Units. Sept. 7, 1942, to Mar. 1, 1946.  
     Series H-O. Nos. 1 to 195. Survey of Dwelling Unit Occupancy. Sept. 2, 1942, to Oct. 19, 1945.
6. U. S. Bureau of the Census. Population. HVet. Nos. 1 to 43. Survey of World War II Veterans and Dwelling Unit Vacancy and Occupancy in . . . . Oct. 22, 1946, to date.
7. U. S. Bureau of the Census. Population Characteristics of the ——— Metropolitan District: April, 1947. Series P-21, Nos. 1 to 35. July 23 to August 24, 1947.  
     Labor Force Characteristics of the ——— Metropolitan District: April, 1947, Series P-51, Nos. 1 to 35. July 10 to August 24, 1947.  
     Housing Characteristics of the ———

Metropolitan District: April, 1947, Series P-71, Nos. 1 to 35. July 14 to August 24, 1947.

8. For example: Eldridge, Hope Tisdale. Problems and Methods of Estimating Postcensal Population. *Social Forces*, 24, 1:41-46. Oct. 1945.

9. For a more complete description of this method by Dr. Hope T. Eldridge, see: U. S. Bureau of the Census. *Suggested Procedures for Estimating the Current Population of Counties*. Series P-47, No. 4. April 30, 1947.

---

## Women's Clubs Support Cancer and Heart Programs

The Business and Professional Women's Clubs of New York State, at their 28th Annual Convention in May, adopted the following resolutions submitted by their Health Committee Chairman, Sue Thompson Gould, M.D., then Commissioner of the Columbia County Department of Health:

1. That each club stimulate the promotion of a Cancer Detection Clinic through its

county medical society if one has not already been established.

2. That the Business and Professional Women's Clubs of New York State, Inc., through its individual clubs cooperate actively and lend its support to programs of education, research, and service for Heart Disease.

3. That the Business and Professional Women's Clubs of New York State, Inc., through its individual clubs supports the American Heart Association in its effort to establish a county heart association wherever one has not already been established.

# Diagnostic Procedures for Gonococcal Infection

## Summary of a Panel Discussion \*

STAFF members of three laboratories in Baltimore, Md., engaged in routine isolation of the gonococcus maintained an active exchange of experiences through conferences held throughout the past two years. In the first paper they presented a detailed *critique* based on the chapter "The Gonococcus" in the second edition of *Diagnostic Procedures and Reagents*. The purpose was to reach some general agreement on certain points, to clarify the problems most in need of further investigation, and to suggest important features for possible revision.

The comments can, in general, be grouped under three headings: points on which there is evident need for further study, predominantly those on which the three laboratories found themselves at variance; points which should be amplified by the inclusion of additional or alternative methods, several of which have been published subsequent to publication of the chapter; and points

which might be clarified by changes in the language of the text.

Those subjects suggested as needing further study cover practically the entire range of the problem, including: the relative merits of wet and dry swabs, the liquid to be used as a moistening agent for them, the choice of suspension media, methods of inoculating plates, the media to be used, the need for nutritional "supplements" and for inhibiting agents both for repressing growth of extraneous organisms and for counteracting the effect of therapeutic drugs, the relative sensitivity of all suggested modifications of media as studied in large enough series to be statistically significant, methods of transportation including refrigeration and shipment by mail, the establishment of schedules for smears and cultures for determining bacteriological cure, the validity of all methods for this purpose, and the value of the examination of urine, prostatic secretions, and paraurethral and cervical

\* Presented before the Laboratory Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 11, 1946.

**A Tri-Laboratory Analysis of Diagnostic Procedures and the Presentation of Investigations Pertaining to Them.** Justina H. Hill, Sc.D., E. Ellen Nell, and Adelaide H. Mueller, The U. S. Public Health Service and The Johns Hopkins University Venereal Disease Research and Post-Graduate Training Center, Baltimore, Maryland; C. Leroy Ewing, Theodore C. Buck, Jr., Emanuel Kaplan, Sc.D., Rudolph Clark Turner, and Katherine E. Welsh, The Baltimore City Department of Health; C. A. Perry, Sc.D., Elizabeth Petran, Ph.D., and Patricia Haugh, The Maryland State Department of Health.

**Procedures for the Transportation, Isolation, and Identification of the Gonococcus, as Employed by the Venereal Disease Laboratory.** J. D. Thayer, Ph.D., Venereal Disease Research Labo-

ratory, United States Public Health Service, Stapleton, Staten Island, New York.

**A Comparison of the Efficiency of Three Common Methods of Transportation of Gonorrheal Specimens.** Lenore Peizer and Gustav I. Steffen, Ph.D., Department of Health, City of New York.

**Transportation of Specimens for Gonococcus Culture.** Nell Hirschberg, Ph.D., State Laboratory of Hygiene, Raleigh, North Carolina.

**Isolation of Gonococci from Specimens Received in Coagulated-Blood Gelatin Agar.** Marion B. Coleman, Division of Laboratories and Research, Albany, New York.

**The Oxalate Salt of p-Aminodimethylaniline. An Improved Reagent for the Oxidase Test.** Charles M. Carpenter, M.D., Lief G. Suhrland, and Martha Morrison, University of Rochester, Rochester, New York.

**A Comparative Study of Media for the Primary Isolation of the Gonococcus.** Thomas H. Weller, M.D., Children's Hospital, Boston, Massachusetts.

swabs. Further study of the microscopic smear technic is suggested particularly in respect to the significance and classification of various atypical findings and the standardization of terminology in evaluating and reporting such results.

Alternative or additional methods are suggested for: inoculation procedures, the direct inoculation of plates from the original swab without emulsification and centrifugation, and the inoculation of chocolate broth tubes and agar slants in addition to plates in the case of blood cultures and joint and spinal fluid cultures; the choice of media, permitting the use of several of the newer modifications; the use of "spotting" as well as "flooding" technics in examining plates for oxidase reactions; the choice of carbohydrates for confirmatory tests, especially the possible omission of lactose for such purpose in routine work.

Direct disagreement with the present chapter is expressed in two particulars: the use of poured plates for blood cultures is considered inadvisable, and exception is taken to the statement that continued examination of smears containing extracellular diplococci will *usually* reveal intracellular organisms. It is also suggested that the chapter might be improved by the inclusion of some colored plates and that the section on complement-fixation should be subordinated, since this procedure is not in general use.

Some clarification in the wording of the chapter is suggested, particularly in respect to those portions dealing with the choice of microscopic or cultural methods or their simultaneous use, the classification of smear findings, the interpretation and reporting of the presence and relative number of pus cells, the definition of "false" positive and negative findings, the amount of carbon dioxide present in candle incubation jars, the carbohydrates to be used for confirmation, and the exact wording of reports.

Accompanying this *critique* the same authors submitted a brief resumé of experimental data accumulated during their investigations. Of a total of 183 smears examined in the three laboratories, complete agreement was reached on only 98 smears; in an additional 76 smears two laboratories agreed, while a third was at variance; and on 9 smears each laboratory reported a different finding. Tests of the various plating media were made by having each laboratory prepare the medium which it was routinely using and having these plates inoculated by the same person from the same sulfathiazole resistant case of gonorrhea. Sixteen such cases were evaluated on five different media: Difco with supplement A, Difco with supplement B and 3 per cent ox serum, cysteine chocolate agar, Mueller's medium, and Cohn's medium. Positive cultures ranged from 11 and 10 on the first three media to 8 and 5 on the two last named. When the three laboratories prepared the same medium, Difco with supplement A, only minor differences were noted although of 14 cases tested in this manner positive findings varied from 12 to 10 in the different laboratories. No difference was noted in a similar experiment using three different lots of hemoglobin.

T. C. Buck, Jr., of the Baltimore City Laboratory, studied a series of urine cultures. The first 15 mL. of urine from each patient was plated as soon as possible. In addition, urethral exudate was obtained and cultured within 10 seconds. This material was collected without prostatic massage and after sulfonamide treatment from 346 asymptomatic males. Urethral cultures were positive and urine cultures negative in 28 cases, while urine cultures were positive and urethral cultures negative in 12 cases. An additional 36 cases yielded positive cultures by both methods.

The Hopkins Laboratory suspended 19 strains of the gonococcus in Proteose

peptone No. 3 with 0.5 per cent sodium chloride, pH 7.6, and made subcultures with minimum inocula at intervals of 1, 2, 4, 6, and 18 hours. One strain was lost in 1 hour, 6 additional strains in 4 hours, 5 more in 6 hours, and by the end of 18 hours 15 of the original 19 strains had been lost.

Mr. Buck also tried a new transportation medium of gelatin agar glycerine base supplemented with fresh egg albumin and ox serum or Difco supplement A.\* Of 313 specimens examined 237 were positive on direct plating within 10 seconds after obtaining the specimens from the patient, and 185 after holding 26 to 28 hours at room temperature before plating.

The Hopkins Laboratory also experimented with the use of clarase in addition to supplement A in Difco medium in the presence of penicillin. Clarase itself was not inhibitory and its use permitted the recovery of gonococci which otherwise would be inhibited by penicillin. This laboratory also compared 24 hour with 48 hour plate readings on clinical cultures on Difco medium and found, in a series of 54 cases, 22 which were negative on 24 hour and positive on 48 hour incubation. An additional study indicated that phenol red could be substituted for Andrade indicator in fermentation media.

The remainder of the panel discussion was devoted to the presentation and discussion of a series of papers containing the results of recent investigations by other laboratories.

Dr. J. D. Thayer presented excerpts from four papers from the Venereal Disease Research Laboratory of the U. S. Public Health Service.† He first showed comparative results obtained in the primary isolation of the gonococcus using Peizer medium, Difco Bacto proteose No. 3 agar and hemoglobin,

Mueller-Hinton medium, and a modification of McLeod's medium. For primary isolation the modified McLeod's medium gave 9 per cent more positive cultures than did Peizer, 17 per cent more than Difco, and 32 per cent more than Mueller. It was also superior in the number of colonies appearing on the plates. Of the countable plates in the series, McLeod's medium averaged 58.8 colonies per plate as compared with 39.6 on Peizer, 37.9 on Difco, and 10.2 on Mueller-Hinton; while on those plates containing too many colonies to make an accurate count, more were graded 4+ with the McLeod medium than with the others. A comparison of inoculating the medium with the swab immediately, i.e., at the patient's bedside, with inoculations after a 3 hour period of storage in broth at room temperature showed the former method to be superior, yielding 96.5 per cent positive plates as compared with 77.2 per cent. Cysteine has been recommended for addition to media to increase the survival of gonococci but experiments showed that it had no such effect. Experiments on delayed incubation of inoculated plates showed that storage of such plates in an atmosphere of 10 per cent carbon dioxide favored the survival of the gonococcus; 96.6 per cent plates so stored were positive as against 71.1 per cent stored in a normal atmosphere. Primary isolation and identification of the gonococcus on

† Thayer, J. D., Shubert, J. H., and Bucca, Matthew. The Evaluation of Culture Mediums for the Routine Isolation of the Gonococcus. *Ven. Dis. Inform.*, 28, 3:37 (Mar.), 1947.

Bucca, Matthew A., Thayer, J. D., and Shubert, J. H. Observations on the Direct Oxidase Test Applied to Gonococcal Colonies Grown in Certain Media. *J. Ven. Dis. Inform.*, 28, 3:40 (Mar.), 1947.

Thayer, J. D., Bucca, Matthew A., and Kirby, Ruth A. An Analysis of Weckstein's Rapid Method for the Primary Identification of the Gonococcus. To be published.

Shubert, J. H., Bucca, Matthew A., and Thayer, J. D. A Study of Preinoculation and Preinoculation Factors in the Primary Isolation of *Neisseria gonorrhoeae*. To be published.

\* *Ven. Dis. Inform.*, 28, 1:6 (Jan.), 1947.

plates of Peizer medium containing glucose and maltose with neutral red as indicator according to the method reported by Weckstein proved unsatisfactory in the hands of the author since 64 per cent of the plates gave atypical reactions. Finally mention is made of the necessity of neutralizing the oxidase reagent *p*-aminodimethylaniline hydrochloride with sodium carbonate to avoid atypical reactions.

Lenore Peizer presented a series of studies on the efficiency of transportation methods for gonorrheal specimens. The same swab was used to inoculate transportation media and control plates of plasma hemoglobin agar. Control plates were incubated within 6 hours of the collection of the specimens, transportation media after storing at room temperature for 24 hours. All cultures were incubated in 8 to 10 per cent carbon dioxide at 36°C. for a period of 40 hours. Of 257 specimens from females, 62 gonococcus cultures were obtained from control plates and 18 from Hirschberg chocolate gelatin, Nile blue A agar. Of 745 similar specimens, 197 gonococcus cultures were obtained from control plates and 173 from slanted plasma hemoglobin agar in tubes containing 10 per cent carbon dioxide, according to the method of Usher and Stein, the tubes in this series being examined after 24 hour as well as 40 hour incubation periods. Of 1,260 specimens from both males and females, 483 gonococcus cultures were obtained from control plates and 459 from a ¼ inch layer of plasma hemoglobin agar in rectangular bottles as recommended by McClure and Miller.

The effect of delayed incubation with Hirschberg medium was studied on a series of 87 specimens from males with acute gonorrhea. All 87 specimens were positive on control plates incubated within 6 hours, 84 were positive on plates and 18 on Hirschberg medium incubated after 24 hours, 43 were posi-

tive on plates and 7 on Hirschberg medium after 48 hours, and 9 were positive on plates and none on Hirschberg medium after 72 hours.

Dr. Nell Hirschberg presented a summary of the present status of methods for the transportation of specimens for gonococcus culture. The literature was briefly reviewed and the following reports were selected as those that have influenced others to try out the methods: Greene in 1938 advocated the use of swabs impregnated with sterile ascitic fluid for making smears, stating that the preliminary incubation of these swabs increased the number of intracellular organisms; Cox in 1942-1943 first advocated a horse blood solution with 1:30,000 gentian violet and later horse serum with 1:800,000 gentian violet; Peizer in 1943 reported the use of plasma hemoglobin cysteine agar and Stein described the use of Peizer's medium in tubes into which carbon dioxide had been introduced; Hirschberg in the same year used 20 per cent chocolate gelatin agar; Porterfield in 1944 reported the use of Bacto proteose No. 3 with hemoglobin and Bacto supplement A; and Higgenbotham in 1944 advocated the use of 0.2 per cent KNO<sub>3</sub> and shipment in thermos jugs with ice or dry ice. All of these investigators reported better results with cultures than with smears and better results with immediate than with delayed platings.

Russell Stein of the New Jersey State Department of Health in July, 1946, found from questionnaires returned from 44 state health department laboratories that 8 such laboratories offered no routine gonococcus culture service, 27 limited their service to local areas close to their laboratories, and that 10 offered a state-wide service with transportation media. Five of these states used Cox's medium, two used Hirschberg, one used McLeod's agar slants, one used horse plasma hemoglobin agar, and one used Buck's medium. Very few

of the directors of these laboratories felt that their methods were efficient but all agreed that transported cultures, no matter how poor, are superior to smears. This report was accompanied by an exhibit of the outfits distributed by the various states for this purpose.

Dr. Hirschberg then reviewed the experience of the North Carolina State Laboratory with the use of transportation media. She pointed out that while better media may be developed in the future, the present medium has been used in the examination of over 3,500 specimens and has yielded a substantial number of positive cultures from cases that were negative by microscopic examination of smears. Yeast extract is a good source of enrichment nutrients but crystal violet inhibits the growth of many strains of gonococci. Nile blue A which is used in Hirschberg medium does not inhibit the gonococcus but probably does not aid very much in holding down contamination. A good laboratory worker near the clinic or physician's office can isolate the gonococcus by direct culture of specimens from female patients three times as frequently as it can be demonstrated by microscopic smear examinations, and approximately twice as frequently in specimens from males. Transported cultures do not give such high ratios because temperature, food supply, drug therapy, local treatment, and the peculiar habits of the organism itself all interfere with the viability of the gonococcus during transportation. A series of duplicate specimens, half of which were incubated immediately, and half transported by auto in sealed jars for an hour before incubation, showed a drop of 15 per cent in the number of positives. Isolations from Negro and white patients did not differ markedly. Classification by purpose of examination showed 26 per cent positives in specimens for diagnosis, 24 per cent in contact specimens, and 20 per cent in

treatment control specimens. Of 460 routine smear and culture specimens sent by mail, 26 were positive by both methods, 33 by smear alone, and 54 by culture alone. Because New York State Laboratories, using the same medium prepared at a higher temperature and containing more blood, seemed to be getting better results; some comparative series were run with that medium but the difference seems to be accounted for chiefly by the fact that in New York physicians collected a very much larger percentage of the specimens. Occasional positive findings on one but not the other medium emphasize the fact that the more types of media are used the more positive isolations may be expected. At the present time the North Carolina laboratories are using a medium prepared by the original formula for transportation purposes but are using 10 per cent blood in medium prepared at 80°C. for plating.

Marion B. Coleman presented the experience of the New York State Division of Laboratories and Research with transportation media and methods essentially those of Hirschberg. Over a 27 month period, approximately 1,400 specimens from female patients were examined. Gonococci were isolated from 12.6 per cent and were found by microscopic examination in 7.8 per cent. Of the total number of specimens showing gonococci 20 per cent were missed by the culture method and 50 per cent by the microscopic method. In a relatively small series of 100 specimens from males the findings were in sharp contrast, gonococci being demonstrated in 36 per cent by microscopic examination and in 22 per cent by culture. During the same period a series of 711 triplicate specimens were collected from female patients in a local clinic; one swab was used immediately for direct inoculation of a plate which was incubated within 3 hours; a duplicate swab was stored in Hirschberg medium at room temperature



overnight and plates were inoculated the next day; while the third swab was used to prepare films on slides. Gonococci were isolated from 23.4 per cent and found microscopically in only 9 per cent. Direct plating yielded gonococci in 22.3 per cent and delayed plating in 18.7 per cent. It was concluded that reliance should not be placed on either microscopic or cultural examinations alone; both procedures are desirable.

Martha Morrison, in the absence of Dr. Charles M. Carpenter, presented a report on an improved reagent for the oxidase test. The oxalate salt of *p*-aminodimethylaniline has proved superior to the monohydrochloride salt previously recommended, being more stable and less likely to yield cloudy and highly colored solutions. Six months' storage in amber colored bottles showed no visible change in the dry oxalate salt, whereas the monohydrochloride showed pronounced darkening; 1.0 per cent aqueous solutions have greater clarity and show less precipitation on standing, colorimeter tests indicating that the oxalate solution needed to stand 72 hours in order to give a reading equivalent to the 24 hour reading of the monohydrochloride. A slight disadvantage of the oxalate is that it goes into solution somewhat more slowly, but this can be overcome by gentle heating.

Dr. Thomas H. Weller, the final speaker on the panel, presented a comparative study of media for the primary

isolation of the gonococcus.\* Cervical and urethral swabbings collected from 815 venereal disease clinic patients served as the test material. Each specimen was suspended in proteose-peptone broth and thoroughly mixed; a drop of the suspension was then placed on plates of each of five media and spread over the surface with a wire loop. A modified Peizer medium, using human red cells and plasma, detected the greatest number of positives, 96 per cent; while Mueller-Hinton media, both freshly prepared and dehydrated (Difco), detected 90 per cent; 74 per cent of the known positives grew on Bacto proteose No. 3 agar with Bacto-hemoglobin and 72 per cent on the same medium with Bacto yeast supplement A. No difference was observed between the freshly prepared and dehydrated Mueller-Hinton media, and the speaker suggested its use in laboratories where limited facilities necessitate the employment of a dehydrated medium.

The discussion was brought to a conclusion with the statement of the panel leader, Dr. Justina Hill, that the morning's discussion had certainly shown how little was known about several aspects of gonococcus culture work and how great was the need for further study.

---

\* Weller, T. H., and Williams, J. E. Comparative Study of Media for the Primary Isolation of the Gonococcus. *Am. J. Syph. Gonorr. & Ven. Dis.*, 30, 4:386 (July), 1946.

# American Journal of Public Health and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 37

November, 1947

Number 11

---

## Editorial Board

REGINALD M. ATWATER, M.D.  
*Chairman and Managing Editor*

LEONA BAUMGARTNER, M.D.  
MARTIN FROMISHER, JR., D.Sc.  
PROFESSOR JOHN M. HENDERSON

RALPH S. MUCKENFUSS, M.D.  
STUART MUDD, M.D.  
RAYMOND S. PATTERSON, Ph.D.

C.-E. A. WINSLOW, Dr.P.H.

C.-E. A. WINSLOW, Dr.P.H., *Editor*

AUGUSTA JAY, *Editorial Associate*

---

## THE AMERICAN PUBLIC HEALTH ASSOCIATION

IN climbing a mountain, there are moments when one has surmounted an awkward cliff and pauses for a moment to look back and survey the ground gained as a source of satisfaction and an encouragement for what may be the even greater challenges which lie ahead. Such a moment is the celebration of the 75th anniversary of the American Public Health Association at Atlantic City last month.

The retrospect is of particular interest in this case, since the history of our Association is, in essence, the history of perhaps the most significant social movement of modern times. It was founded at the dawn of a new era, the era in which—for the first time in human history—the life span of the human animal ceased to be a plaything of Lachesis and became a factor largely under the control of the human will; when, in the words of Hermann M. Biggs, it became clear that “within natural limitations, a community can determine its own death rate.”

What was the status of “public health” seventy-five years ago? We had local boards of health in a number of our seaboard cities, dating back to the yellow fever epidemics of the last decade of the Eighteenth Century; but their weapons were limited to the crudest and most empirical procedures of sanitation and quarantine. Chadwick’s epoch-making report on *The Sanitary Condition of the Laboring Population of Great Britain* had, however, been published in 1842; and the even more far-sighted program of Shattuck (probably the most remarkable single document in the history of public health), his Report on the Sanitary Condition of Massachusetts, in 1850. Studies by Panum on measles (1847), by Snow on cholera (1849), and by Budd on typhoid fever (1859) had laid the foundation for modern scientific epidemiology. The anthrax bacillus had been seen by Davaine in 1850; Pasteur, between 1857 and 1865 had established the germ theory of fermentation and the doctrine of biogenesis, and Lister in 1867 had introduced antiseptic surgery. Massachusetts had established the first state board of health in 1869; and California and Virginia had followed suit in 1871, the same year in which the Local Government Board began its work in England. The foundation had thus been well and truly laid; but the construction of the building had not yet been begun. The discovery of controlled immunization (except in the case of smallpox) had yet to wait for the studies of Pasteur in

1880-1881; the discovery of the tubercle bacillus was to come only in 1882, and that of the diphtheria bacillus in 1884.

It was then a bold and creative vision which animated nine physicians<sup>1</sup> and one architect<sup>2</sup> to meet in New York City on April 18, 1872, and decide on the establishment of a national sanitary association. At this meeting a committee on permanent organization was appointed under the chairmanship of Stephen Smith; and on September 12 of the same year the American Public Health Association was formally organized at Long Branch, N. J., a constitution was adopted and Stephen Smith named as our first president. The objects of the Association were: "the advancement of sanitary science and the promotion of organizations and measures for the practical application of public hygiene"; and members (elected by two-thirds of the members present at an annual meeting, after recommendation by a majority of the Executive Committee) must be "selected with special reference to their acknowledged interest in, or devotion to, sanitary studies and allied sciences and to the practical application of the same."

It is of interest to note that the *New York Times* of September 17, 1872, in a discussion of "Minor Topics" on its editorial page made the following pertinent comment:

"We trust the American Health Association will prove worthy of its title, and of the formidable list of committees to which the leading subjects which it undertakes to investigate have been referred. There is a vast unoccupied field awaiting the action of such a society, and the many eminent names which appear among its members must secure, under proper organization, the obtaining of some very valuable results. Sanitary science, considered either in its statistical or other aspects, is but in its infancy among us, and there is certainly nothing more systematically neglected in our great cities than the most rudimentary and obvious of sanitary laws. We hope that the Association will direct its attention to the educating of public sentiment as well as to the furnishing of scientific data."

The first two meetings of the Association for the formal presentation of papers were held in the spring and fall of 1873; and the quality of these contributions<sup>3</sup> was extraordinarily high. Stephen Smith made a reasoned and impassioned plea for increased longevity. He said, in relation to the vital statistics of the time, "Of the children born, what vast percentages never see the anniversary of their birth? What other large percentage dies within five years? How few, comparatively, reach the age of ten? At twenty the generation has dwindled to an insignificant minority, and at thirty-three to forty-five it disappears altogether."

Against this picture—not very much exaggerated so far as our great cities were concerned—he sets the century mark as a normal span for human life.

Francis A. Walker, then Superintendent of the Census, gave an extraordinary analysis of the relation of race and nationality to mortality in the United States which could well be used as a background by present-day students in this field. F. A. P. Barnard, President of "Columbia College" presented a thoughtful and open-minded analysis of current evidence in regard to the new germ theory of disease. Andrew D. White, President of Cornell, opened up the topic of "Sanitary Science in Its Relation to Public Instruction." Carl Pfeiffer discussed the "health principles of architecture." Austin Flint described the epidemic at North Boston, N. Y., in 1843, clearly traced to a polluted well, the first convincing example of this phenomenon upon our continent. Smallpox, cholera, and yellow fever, of course, received much attention. In the field of practical health administration, Elisha Harris presented a very sound review of the principles of "state

and local sanitary organization," and John M. Toner anticipated the work of the Committee on Administrative Practice with data obtained by a questionnaire on the administrative set-up and vital statistics procedures (including some salary scales) of 137 state and local boards of health in the United States. This subject was set up as a continuing activity of the Association through the presentation in 1875 of the report of a Committee on the Plan for a "Systematic Sanitary Survey of the United States," which included a schedule of inquiries running to more than 500 specific questions. At the same session<sup>4</sup> Dorman B. Eaton, whose framing of the health laws of New York City is the basis of all our public health powers of today, presented an analysis of the political principles of health legislation which is still vital and inspiring in 1947.

The history of the Association (and of public health in general) from 1872 to 1921 has been admirably reviewed in a volume edited by M. P. Ravenel<sup>5</sup>; and in 1972 a second volume of this history should be compiled. Here, we can mark only the high points of the story. During the first quarter-century of the life of the Association, the annual meetings and the annually printed "Reports and Papers" essentially constituted its life history; and these volumes form fascinating reading. Eloquent laudations of Hygeia were not lacking; and we must not be surprised to find discussions of the influence of forests on health and proposals for the disinfection of sewers by ozone. We find also sound judgment and broad vision, which included such urgent present-day problems as housing (Stephen Smith called the home "the unit of sanitary administration"), industrial health, railway sanitation, and the like.

One cannot take one of these old volumes from the shelf without finding passages which are prescient and inspiring; and many a valuable doctoral dissertation could be based on a serious analysis of the trends of thought which they represent.

The gift by Henry Lomb of Rochester in 1884 of \$2,000 to be awarded for essays on certain specified topics (which included housing and nutrition, school hygiene and occupational hygiene) produced a crop of particularly significant papers in 1885.

By 1890, the membership of the Association had grown to over 500 and it was rated as "the largest and most influential organization in the world in shaping public health opinions." Most significant of all was the fact that this Association, conceived in New York City, and made national in scope in New Jersey, became international with the invitation to Canadian health workers to join in 1884. In 1892, Mexican health authorities took similar action and in 1902 Cuba followed suit. Our Association represents the public health movement not only in the United States but in the whole of the North American continent. Four flags are displayed on our platform; and representatives of Canada, Cuba, and Mexico have played a leading rôle in our program and in our organization as a whole.

Perhaps the most important step in the history of the Association (after the foundation of the Association itself in 1872) was the creation of its first specialized section, the Laboratory Section, in 1899. A series of preliminary conferences and committees initiated by Wyatt Johnston between 1894 and 1899 led to this happy result. Nearly one hundred members enrolled in the Section at once, of whom about half were new members of the Association. We are now, in the history of the Association, well within the limits of personal memory; and the writer can clearly recall the extraordinary influence of the Laboratory Section in bringing the methods and the attitudes of exact science into its deliberations.

This Section was the vital growing-point of the A.P.H.A. in the first decade of the present century. The precedent thus set was followed in other fields at the end of this demonstration period and thereafter, as the chronological list of our present Sections indicates:

1899	Laboratory Section	1921	Maternal and Child Health
1908	Health Officers	1922	Public Health Education
1908	Vital Statistics	1923	Public Health Nursing
1911	Engineering	1929	Epidemiology
1914	Industrial Hygiene	1942	School Health
1917	Food and Nutrition	1943	Dental Health

Thus, when the Association held its Fifty Year Jubilee in 1921, Stephen Smith who—at the age of 99—gave an address, could look back with pride on the edifice whose cornerstone he had laid. Already we had sections representing expertness in seven different specialized fields of public health (with five more to come). Increasingly these sections have become the life blood of the Association. The program of our annual meeting is a section program, with a dozen addresses at general and special sessions as frosting on the cake. The activities of the members of these sections furnish the advancing knowledge on which our program is based; and it is of incalculable importance that through the Association itself they are united in a profession conscious of its singleness of purpose and devoted to the general cause of public health.

In connection with the development of all the activities of the Association its regular printed publications have played an important rôle. For the first forty years of its history it published the annual volumes of *Reports and Papers*, to which reference had been made in a preceding paragraph. Volumes I to XXXIII of this series covered the annual meetings from 1873 to 1907. Volumes XXXIV and XXXV (1908 and 1909) were also printed in the *American Journal of Public Hygiene*. This was a publication with its own distinguished history, having been founded in 1890 as the *Journal of the Massachusetts Association of Boards of Health*. This *Journal* became the *American Journal of Public Hygiene* in 1904; and in 1908 became also the official organ of the American Public Health Association Laboratory Section. In 1911, its name was changed to the *American Journal of Public Health* and this *Journal* has since superseded the *Reports and Papers* which were no longer published after 1912. B. R. Rickards, Livingston Farrand (1912), S. M. Gunn (1914), A. W. Hedrich (1918), M. P. Ravenel (1924), and H. S. Mustard (1941) have successively guided the fortunes of the *Journal*, and a very special debt is due to Ravenel for his 17 years of devoted editorship.<sup>5</sup> The names of Henry F. Vaughan and Homer N. Calver must be mentioned appreciatively in connection with the *Journal*. They served on a committee appointed by the Executive Board in 1923 to edit the *Journal* with Dr. Vaughan as Chairman.

In early years the office of the Association and the editorship of the *Journal* were identified in the same person (Rickards, Gunn, Hedrich). It was only in 1921 that the offices of the Association were moved to New York City in proximity to the other associations which made up the National Health Council; and only in 1923 that a full-time General Secretary without major editorial responsibility was appointed (H. N. Calver). After a brief interim, R. M. Atwater was appointed Executive Secretary in 1935, and for 12 years he has given us leadership so wise and so courageous, so human, so patient, and so farseeing that the recognition which he received at Atlantic City last month falls far short of his

desserts. The Association has been fortunate in having many devoted workers on its staff over the years; among them at the present time are five who have each given twelve years or more of top-grade service—Mrs. W. R. Walsh, whose efficiency and charm are central in all headquarters affairs, Miss Jeanne Bickel as accountant, Miss Edith Boyd as Associate Secretary of the Committee on Administrative Practice, Mrs. Augusta Jay as Editorial Associate, and Miss Elsie Siemer as Membership Secretary.

From a purely administrative standpoint, the year 1922 will always be memorable on account of the new Constitution then adopted. This document gave the Association a method of electing its Governing Council which is admirable and—so far as we are aware—unique. The make-up of this Council which includes three classes, officers of the Sections, representatives of local branches, and members-at-large elected by written ballot at the annual meeting, insures the broadest and most responsible representation of all important elements; and is absolutely fool-proof against any form of political manipulation. The second important provision of this Constitution was the creation of Fellowship grade which leaves the educational opportunities of the Association open to all who are interested in public health but maintains its direction in the hands of qualified professional experts. Under this plan the Association has shown phenomenal growth, from less than 3,000 members in 1923 to 11,382 members in October, 1947. Of these, 1,792 were Fellows. In the same period, the budget of the Association rose from less than \$100,000 to approximately \$350,000.

Development at the periphery has been equally rapid. We have now 27 local affiliated state (or regional) societies (including Cuba and Puerto Rico). In 1928 the Western Branch was established to hold regional meetings, representing wider areas at a distance from the nearest Association membership; and a similar Southern Branch was formed in 1932. In 1943 an annual tour of speakers, representing the Association, to address a series of special meetings in the Western States was inaugurated and has been continued with notable success.

To turn now from problems of organization to concrete achievement, we may set in the first place, historically, the development of standard procedures in the laboratory field. One of the first steps taken by the newly-formed Laboratory Section at the beginning of the century was the development of sound and uniform procedures for the examination of water and milk. The first edition of *Standard Methods for the Examination of Water and Sewage* appeared in 1905, preceded by six reports; that on the examination of dairy products, in 1910. It happens that in the present year (1947) both of these important committees have completed the Ninth Editions of their standard procedures.<sup>6</sup> The value of these reports in developing sound scientific knowledge and securing uniformity of official practice has been simply incalculable and their influence has been world-wide.

The importance of activities of this type was so evident that, in 1930, an overall Committee on Research and Standards was set up as one of the permanent Standing Committees of the Association under the successive chairmanships of Abel Wolman, L. R. Thompson, K. F. Maxcy, and Thomas Francis. An exhaustive monograph, *Diagnostic Procedures and Reagents*, first issued in 1941, is one of the most important recent contributions along this line.

In the area of epidemiology a similarly significant achievement has been the preparation (under the inspired leadership of Haven Emerson) of a series of reports on the *Control of Communicable Diseases*. These reports (1917, 1926, 1935, 1940, 1945) have given us a tabulation of the most important known facts as to the etiology of 72 different communicable diseases, with clear indication of

the administrative methods of recognition, reporting, isolation, and quarantine necessary for their control. These procedures are rapidly being adopted by our various states. The current report was translated into Arabic, French, Italian, Portuguese and Spanish under the Office of War Information. It has been considered for official adoption by China, Canada, the United Kingdom, and various Pan-American Republics.<sup>7</sup>

The Vital Statistics Section has rendered similar—if less dramatic—service in promoting soundness and uniformity of statistical procedures in the field of public health. Its reports have been accepted as authoritative in this country and have had an important influence on the preparation of standard tables of mortality and morbidity on an international scale.

The establishment of the Committee on Administrative Practice in 1920, (made a permanent Standing Committee in 1926) may perhaps be considered to mark a third significant stage in the development of the American Public Health Association. During the Nineteenth Century, as we have seen, its services were rendered mainly through the rather general stimulation of its annual meetings. The establishment of sections with their reports on standard methods and the development of the *Journal* ushered in a phase in which invaluable contributions were made in the evaluation of sound procedures in the diverse special fields of public health. The C.A.P. initiated a vigorous revival of activities concerned with the balance and administrative efficiency of the public health program as a whole, such as Harris and Billings had visualized in the 1870's.

The inspiration of this committee was the pioneer work of C. V. Chapin, who had for years emphasized the responsibility of the health officer for getting maximum results from each health dollar and who published the first comprehensive survey of the work of our state health departments in 1915. The committee has operated under the successive chairmanships of C.-E. A. Winslow (1920–1935), E. L. Bishop (1936–1941), Henry F. Vaughan (1942–1943), and W. L. Halverson (1944). Watson S. Rankin was its first full-time Field Secretary (1923–1925) and W. Frank Walker (1925–1931) its second, each making outstanding contributions. The services of Carl E. Buck as Field Director for 16 years has been of supreme value.<sup>8</sup>

The five major objectives of the C.A.P. have been stated succinctly as follows:

1. Secure authentic information as to the actual practice of American communities in the field of health organization.
2. Utilize the information in the form of a typical community health program which might be set up as a norm or as a general guide to be used by any community which aspires to provide adequate health protection for its citizens.
3. Devise a method by which the health officer may appraise the results obtained by his program.
4. Make results of surveys, standards of administrative practice, and appraisal procedures directly available to health officers.
5. Secure popular support for public health programs by using the appraisal scheme to arouse local interest in health achievement.

Its first step was to prepare—on the basis of preliminary surveys of nearly 200 cities—an appraisal form for the objective recording (so far as possible in quantitative terms) of the actual performance of a given community; and the results of this study were crystallized in the volume prepared by I. V. Hiscock on *Community Health Organization*. In 1929, the committee began active stimulation of sound administrative practice through the Health Conservation Contest and the

National Health Honor Roll. In 1943, this effective promotional device had fulfilled its purpose and the committee replaced it by the application of Health Practice Studies as a basis for a National Reporting Area. The competitive element is thus subordinated, and a basis laid for continuing uniform comparative recording of actual results obtained, carried out through the medium of the state health administrations. Louis I. Dublin has stated "I have no hesitation whatever in saying that the appraisal methods developed by the committee have truly revolutionized public health practice in the United States and in some other countries as well."

One of the most important revelations of the committee's studies was the deplorable lack of organized health services in the rural areas of the United States and Canada. In 1942 the Association adopted a resolution demanding complete coverage with full-time health service for both countries; and a subcommittee on Local Health Units was appointed (under the chairmanship of Haven Emerson). In 1945 a bold and creative report was published on *Local Health Units for the Nation*. The committee has prepared a detailed outline showing how the entire United States could be covered by 1,200 local administrative units, each under the direction of a full-time trained medical health officer assisted by the necessary sanitary, nursing, and other personnel. The program proposed is being actively promoted by institutes in various strategic areas; and the progress made in many states is such as to encourage the hope that the ideals set forth should be within our grasp in the next decade.

Another most fruitful new avenue of usefulness was opened up in 1932 by the establishment of the Committee on Professional Education, as one of the three major Standing Committees of the Association concerned with constructive service in the public health field, alongside of the Committee on Research and Standards and the Committee on Administrative Practice. No administrative machinery, however perfect, can function without the right personnel; and, in a field of such diverse specialization as ours, the problem is one of great complexity. Under the chairmanship of W. L. Leathers and W. P. Shepard, this committee has accomplished herculean tasks. It has formulated detailed and precise statements defining the qualifications for health officers and for fourteen different types of specialists in various fields of public health. It set up in 1940 a Merit System Unit in the office of the Association which has undertaken the preparation of examinations to be used by states and cities in the selection of professional public health personnel. The unit has combined the judgment of experts in the various specialties of public health with tested psychological techniques and has prepared, on request, 294 examinations in various fields (including 135 for nurses, 76 for laboratory workers, 53 for engineers and sanitarians, 20 for administrators). These examinations have received an extraordinarily favorable reception.

In 1945 the committee established a program for the accreditation of universities offering the degrees of M.P.H. and Dr.P.H., including the formulation of standards and periodic inspection, and eleven such universities have been formally accredited for this purpose. Since 1945 a useful Vocational Counselling and Placement Service has been provided at headquarters; and the committee is carrying on an active campaign for increasing the inadequate salaries of various types of public health personnel.

The Association has not permitted its proper preoccupation with the improvement of what are now recognized as parts of the standard health program to blind it to the widening health challenges of the future. The appointment of a Com-



mittee on the Hygiene of Housing in 1936 has led to the development of a procedure for the objective and quantitative appraisal of substandard housing which has been applied by health officers from Portland, Maine, to Los Angeles as well as in Hawaii and the Canal Zone; and systematic supervision of dwellings is likely to become a regular function of progressive health departments. The committee is now preparing a series of reports on standards for the housing of the future; and is analyzing the legal relationships of the health department to housing and preparing the basis for a standard housing code.

The most difficult and most challenging problems of public health in the future are those related to medical care. The aging of the population, with the inevitable relative increase in diseases of later life, has brought this problem before us with compelling force; and earlier attempts to separate "preventive" from "curative" medicine have proved obviously unworkable. A subcommittee of the C.A.P. on Organized Care of the Sick had been in existence from 1921 to 1935. In 1937, a new committee was appointed to study the public health aspects of medical care and to cooperate with various associations "in extending public health work to meet modern needs." In 1943, after a period of intensive study and discussion, this group, whose name had in 1943 been changed to Subcommittee on Medical Care, with Dr. Joseph W. Mountin of the Public Health Service as chairman, presented to the parent committee and, in turn, to the Governing Council of the Association "a set of principles expressing the desirable content of a comprehensive program of medical care, the methods of its administration, and the part which public health agencies should take in its operation." As a result, Medical Care in a National Health Program, an Official Statement of the American Public Health Association, was adopted by the Governing Council on October 4, 1944.<sup>9</sup> This report recognized the vital need for a national program of medical care that should make available to the entire population all essential preventive, diagnostic, and curative services of the highest standard, and rendered under conditions satisfactory both to the public and to the medical professions. It pointed out that the public health agencies—federal, state, and local—must obviously carry a major responsibility in administering any comprehensive program of medical care. The Association, by this action, aligned itself with the forces of constructive progress in this field and is in position to render the greatest service in guiding such progress along sound professional lines.

Since 1946 the Subcommittee on Medical Care has had the services of a small, but expert staff; and has recently participated in a joint study of the principles which should govern the care of the chronically ill which has received the joint approval of the American Hospital Association, the American Medical Association, the American Public Health Association, and the American Public Welfare Association.<sup>10</sup>

Two events of general Association history during the past quarter-century have been the establishment of the William T. Sedgwick Memorial Medal Award in 1924, and of the Albert B. and Mary Lasker Awards in 1945. These provisions for the recognition of distinguished service to the cause of public health have proved (as did the Lomb Prizes in an earlier day) of national significance; and the actual awards add greatly to the color of our annual meetings.

This highly condensed review of the past history of the A.P.H.A. may well give us cause for gratification. We owe a deep debt to the founders of 1872 and to the far-sighted leadership which has carried our standard onward to even greater achievement. The list of past presidents (reproduced in this issue of the

*Journal*) is in itself an inspiration. Stephen Smith, John S. Billings, Henry P. Walcott, G. M. Sternberg, Frederic Montizambert, Samuel H. Durgin, Eduardo Liceaga, Peter H. Bryce, Benjamin Lee, Walter Wyman, Carlos J. Finlay, F. F. Westbrook, J. N. Hurty, Rudolph Hering, W. T. Sedgwick, C. J. Hastings, Lee K. Frankel, M. P. Ravenel, W. H. Park, George W. Fuller. Here is an honor roll of the finest public health leadership in Canada and Cuba and Mexico and the United States—health administrators, laboratory workers, engineers, university teachers, great public servants. There are a dozen more in later years—of the same distinction—who are still active in the councils of the Association.

The founding fathers set our goal at a human life span of one hundred years; and Stephen Smith, in his own person attained this goal. The century-mark has not yet become the average expectation of life; but in 75 years we have made outstanding progress toward this goal. In 1871 the general death rate of New York City was 28.3; in 1946 it was 10.4—a decrease of 63 per cent. In 1870 Francis A. Walker estimated the average expectation of life at birth in the United States at 39 years; in 1946, it is 65 years—an increase of 67 per cent.

These figures are familiar and we take them as a matter of course. Perhaps the most fundamental task of public education is to make people realize the obvious—to grasp its actual meaning in human terms, with their inner consciousness and not merely with their eyes and ears. If you could stand by the bedside of a man dying at 39 and tell him he could live for 26 years more, that would be recognized as a miracle. Such a miracle has actually happened to the average man in the last seventy-five years. There is no comparable phenomenon in the history of the human race. Wars and depressions are minor and temporary compared with this achievement. It has recently been pointed out that our casualties in World War II (300,000) were more than balanced by reductions in the civilian death rate during the same period. The decline in maternal and infant mortality rates during these years, alone, correspond to a saving of 175,000 lives.<sup>11</sup>

We may well be proud of the past. To the young men and women who may read this editorial, we say "Carry On." The next quarter-century is in your hands.

## REFERENCES

1. C. C. Cox (D. C.), Elisha Harris, E. H. Jones, Moreau Morris, J. Ordonaux, J. H. Rauch (Ill.), Heber Smith (D. C.), Stephen Smith and E. M. Snow (R. I.).
2. Carl Pfeiffer (N. Y.).
3. *Public Health Reports and Papers presented at the Meetings of the American Public Health Association in the Year 1873*. Vol. I. Hurd and Houghton, (N. Y.), 1873.
4. *Public Health Reports and Papers*. Vol. II. 1876.
5. Atwater, R. M. The Journal Is 36 Years Old *A.J.P.H.*, 35:1305, 1945.
6. Two Ninths. Editorial, *A.J.P.H.*, 37:909, 1947.
7. Editorial. Control of Communicable Diseases. *A.J.P.H.*, 35:162, 1945.
8. Halverson, W. L. A Twenty-five Year Review of the Work of the Committee on Administrative Practice. *A.J.P.H.*, 35:1253, 1945.
9. Medical Care in a National Health Program. *A.J.P.H.*, 34:1252, 1944.
10. Planning for the Chronically Ill. *A.J.P.H.*, 37:1256, 1947.
11. Moriyama, I. M. Vital Statistics During the War. *Yale Journal of Biology and Medicine*, 19:453, 1947.

### Presidents of the American Public Health Association

* Stephen Smith, M.D.....1872, 1873, 1874	* Elisha Harris, M.D.....1875
* Joseph M. Toner, M.D.....1875	* James L. Cabell, M.D.....1876
* Edwin M. Snow, M.D.....1876	* John S. Billings, M.D.....1877
* John H. Rauch, M.D.....1877	* Charles B. White, M.D.....1878
* Deceased	

* Robert C. Kedzie, M.D.....	1882	* W. T. Sedgwick, Sc.D.....	1915
* Ezra M. Hunt, M.D.....	1883	John F. Anderson, M.D.....	1916
* Albert L. Gihon, M.D.....	1884	* W. A. Evans, M.D.....	1917
* James E. Reeves, M.D.....	1885	* C. J. Hastings, M.D.....	1918
* Henry P. Walcott, M.D.....	1886	* Lee K. Frankel, Ph.D.....	1919
* George M. Sternberg, M.D.....	1887	W. S. Rankin, M.D.....	1920
* Charles N. Hewitt, M.D.....	1888	* Mazÿck P. Ravenel, M.D.....	1921
* Hosmer A. Johnson, M.D.....	1889	A. J. McLaughlin, M.D.....	1922
* Henry B. Baker, M.D.....	1890	* E. C. Levy, M.D.....	1923
* Frederick Montizambert, M.D.....	1891	* W. H. Park, M.D.....	1924
* Felix Formento, M.D.....	1892	Henry F. Vaughan, Dr.P.H.....	1925
* Samuel H. Durgin, M.D.....	1893	C.-E. A. Winslow, Dr.P.H.....	1926
* Emmanuel P. Lachapelle, M.D.....	1894	* Charles V. Chapin, M.D.....	1927
* William Bailey, M.D.....	1895	Herman N. Bundesen, M.D.....	1928
* Eduardo Liccaga, M.D.....	1896	* George W. Fuller.....	1929
* Henry B. Horlbeck, M.D.....	1897	A. J. Chesley, M.D.....	1930
* Charles A. Lindsey, M.D.....	1898	Hugh S. Cumming, M.D.....	1931
* George H. Rohe, M.D.....	1899	Louis I. Dublin, Ph.D.....	1932
* Henry Mitchell, M.D.....	1899	John A. Ferrell, M.D.....	1933
* Peter H. Bryce, M.D.....	1900	Haven Emerson, M.D.....	1934
* Benjamin Lee, M.D.....	1901	Eugene L. Bishop, M.D.....	1935
* Henry D. Holton, M.D.....	1902	Walter H. Brown, M.D.....	1936
* Walter Wyman, M.D.....	1903	Thomas Parran, M.D.....	1937
* Carlos J. Finlay, M.D.....	1904	* Arthur T. McCormack, M.D.....	1938
* Frank F. Westbrook, M.D.....	1905	Abel Wolman, Dr.Eng.....	1939
* Franklin C. Robinson, LL.D.....	1906	Edward S. Godfrey, Jr., M.D.....	1940
* Domingo Orvananos, M.D.....	1907	* W. S. Leathers, M.D.....	1941
* Richard H. Lewis, M.D.....	1908	John L. Rice, M.D.....	1942
* Gardner T. Swarts, M.D.....	1909	Allen W. Freeman, M.D.....	1943
* Charles O. Probst, M.D.....	1910	Felix J. Underwood, M.D.....	1944
* R. M. Simpson, M.D.....	1911	John J. Sippy, M.D.....	1945
* J. N. Hurty, M.D.....	1912	John J. Sippy, M.D.....	1946
* Rudolph Hering, Sc.D.....	1913	Harry S. Mustard, M.D.....	1947
W. C. Woodward, M.D.....	1914	Martha M. Eliot, M.D.....	1948

\* Deceased

## THE VICTORY OVER MATERNAL MORTALITY

ONE of the most striking achievements in the whole realm of vital statistics is the reduction in the maternal mortality of the United States during the past decade. Between 1915 and 1933, this rate fluctuated between 6 and 8 maternal deaths per 1,000 live births (except for an increase to about 9 in 1918). Since 1933, there has been a steady and continuous decline to a trifle over 2 such deaths per 1,000 live births in 1944 and 1945.

This is a really extraordinary phenomenon. It is difficult to think of any really comparable instance, in which the mortality rate from any particular disease or group of diseases in the United States has been cut by two-thirds in one decade.

Furthermore, it seems difficult to explain that decline on the basis of any fundamental change in general public health policies or techniques. The Children's Bureau and the state and local health departments and the nursing associations and other voluntary agencies have played their part in the happy result; but these agencies have progressed steadily and did not introduce any sudden change of program ten years ago. For so sharp a break in trend, we must look for some new factor.

What did happen in the thirties was the conduct of a series of studies by the

New York Academy of Medicine<sup>1</sup> and by other state and local medical societies of the causes of maternal mortality in routine family and institutional practice; and these studies led to clear and courageous conclusions in regard to the considerable volume of maternal deaths due to faulty obstetrical practice and, particularly, to unnecessary recourse to instrumental delivery. These reports brought about amazingly prompt reform in such practice; and it seems probable that this factor—the one new factor which entered the picture ten years ago—must be given major credit for the results of the past decade. If such be the case, we have here a striking example of an outstanding public health success accomplished largely by the medical profession itself through the leadership of its own professional organizations.

REFERENCE

1. *Maternal Mortality in New York City*. New York: The Commonwealth Fund, 1933.

# Clearing House on Public Health

## Salary Information

EXECUTIVE SALARIES  
13 LARGE CITIES

Earl Smith, M.D., Medical Director of the Communicable Disease Control Section of the St. Louis City Division of Health, furnishes the following material based on a questionnaire study of city health department salaries at the executive level in 13 of the largest cities

in the United States. By way of caution he says, "It should be emphasized that comparison of an individual city with the average will only indicate whether it is out of line with usual practices and suggest the need for further analysis of operations." It should further be noted that this is a tabulation of maximum salaries.

MAXIMUM SALARIES AT EXECUTIVE LEVEL, THIRTEEN LARGE CITY HEALTH DEPARTMENTS  
AUGUST 1, 1947

AUGUST 1, 1917.											
Directors of											
City	Com- mis- sioner	Deputy Com- mis- sioner	Tuber- culosis Control	Veneral Disease Control	Com- muni- cable Disease Control	Child Hygiene	Sanitary Engi- neering	Public Health Labo- ratory	Public Health Nursing	Public Health Educa- tion	Vital Statis- tics
Detroit	\$18,500	\$12,000	\$9,250	\$9,250	\$8,650	\$9,250	\$7,441	\$9,250	\$6,269	\$4,761	\$4,285
San Francisco	13,500	7,920	7,200	7,200	7,920	7,920	5,760	4,620	5,320	5,340	3,480
Los Angeles	12,480	8,124	6,540	6,540	6,540	6,540	7,296	6,540	5,280	5,280	3,636
New York	11,000	8,350	7,850	7,850	7,850	7,850	6,350	9,850	7,150	7,850	7,150
Chicago	10,698	9,096	....	6,000	6,954	5,352	....	5,562	3,534	....	4,920
Washington	10,000	9,376	8,059	8,060	6,862	8,060	3,060	6,862	8,060	5,905	4,526
Philadelphia	10,000	4,650	4,800	4,800	5,600	5,600	5,600	5,600	....	....	3,600
Milwaukee	9,600	6,600	5,520	4,920	5,520	5,520	4,200	5,520	3,600	3,600	2,700
Kansas City	8,560	....	4,320*	4,980*	4,980	4,980	5,460	7,740	3,360	2,700	4,000
Buffalo	8,500	7,000	6,000	2,800*	7,000	7,000	5,500	7,000	5,500	3,150	2,948
Pittsburgh	8,000	....	6,500	6,000	5,998	5,467	....	4,115	3,202	....	6,180
Cleveland	7,680	....	6,000	4,680	6,180	6,180	6,180	4,686	4,680	4,680	6,180
St. Louis	7,680	....	5,100	5,100	5,100	5,100	5,100	5,880	4,140	..	3,060
Range of Maximum	18,500	12,000	9,250	9,250	8,650	9,250	8,060	9,850	8,060	7,850	7,150
	-7,680	-4,650	-4,800	-4,680	-4,980	-4,980	-4,200	-4,115	-3,202	-2,700	-2,700
Average Maximum	10,476	8,124	6,620	6,400	6,550	6,524	6,086	6,401	5,014	4,507	4,175
Median Maximum	10,000	8,124	6,500	6,000	6,540	6,180	5,760	5,880	4,920	4,761	3,500

\* Part time

PUBLIC HEALTH EPIDEMIOLOGIST  
SALARIES

Franklin H. Top, M.D., Secretary of the Epidemiology Section of the Association, reports recent action of the Epidemiology Section Council on salaries of epidemiologists as follows:

Cognizant of the difficulties involved in suggesting or determining a salary schedule for epidemiologists which would fit all health units—local, state, and federal—the Epidemiology Section suggests the following broad policy on salaries, patterned after the proposed statement by the Executive Board on salaries of public health administrators:

A. Physicians with an M.D. degree from an approved medical school followed by internship plus a master's degree in public health, not less than 2 years of full-time experience under supervision, should receive a minimum annual starting salary which is not more than one step below the minimum annual starting salary of the administrator, namely \$1,000 under the minimum annual starting salary of \$8,500 suggested for public health administrators with regular increments to a salary level of at least \$10,000. Where there is a marked difference between an administrator and/or his deputy and

the remaining personnel, the minimum starting salary should be not less than \$8,000.

B. Physicians with an M.D. degree from an approved medical school, followed by internship and 2 or more years of successful full-time experience, but without graduate training, should receive an annual starting salary which is *not more* than two steps below the minimum starting salary of public health administrators; namely, \$2,000 under the minimum annual starting salary of \$8,500 suggested for public health administrators with regular increments, to a salary level of at least \$8,000. Where there is a marked difference between an administrator and/or his deputy and the remaining personnel, the minimum starting salary should not be less than \$7,000.

C. In the event that a physician lacks the graduate training but has had a particular formal training such as several years on a communicable disease service or success in an allied field together with a number of years of full-time experience in a well organized health agency, he might be considered for a starting salary between the levels of Categories A and B with the suggestion that academic training leading to the degree of Master of Public Health be obtained at the earliest opportunity.

## LETTERS TO THE EDITOR

### TO THE EDITOR:

In reading the publication by Milton I. Levine in the *American Journal of Public Health*, 1947, vol. 37, page 1089, I note several errors which I would greatly appreciate having corrected, especially in view of the wide circulation of the *Journal*. On page 1092 the studies were undertaken on four different reservations and in southeastern Alaska instead of "8 different reservations." On page 1093 the quotation "It is, of course, not possible to be certain that no bias was unintentionally introduced," refers not as Dr. Levine states to our methods of selection but to an evaluation of the results. On page 1095, Table 7, the percentage of positive tuberculin reactions one year after vaccination was not 56 but 93.3 (*Public Health Reports*, 1946, vol. 61, page 810).

See also the following publications:

"BCG Vaccine," *Amer. Rev. Tuberc.*, 1940, vol. 42, page 661.

"The Specificity and Sensitivity of the Tuberculin Reaction Following Vaccination with BCG." *Amer. J. Hygiene*, 1941, vol. 33, page 45.

"Tuberculosis Control Among the North American Indians." *Amer. Rev. Tuberc.*, 1942, vol. 45, page 49.

I would greatly appreciate your making the above corrections in the near future.

JOSEPH D. ARONSON, M.D.  
Assoc. Prof. Bacteriology,  
Henry Phipps Institute,  
University of Pennsylvania

September 15, 1947

### TO THE EDITOR:

This is to compliment you upon the excellent article by Bleecker Marquette in the August issue of the *American Journal of Public Health* and also upon the fine editorial in the same issue. I thought you both did a fine piece of work in preparing them.

Since so many people in Washington live in rural areas we are particularly concerned with the development of county health councils, a subject of which Mr. Marquette was not overly optimistic. We have four at present in the state which are really county-wide in scope, and two others which are county-wide in name only. By the

end of the month we hope to have off the press a brief pamphlet entitled "Health Councils for Washington." which deals with the rural county health council. I will send you a copy when it is available.

Undoubtedly the development of health councils will be slow, just as full coverage with full-time county health departments, and your support for the idea in the *Journal* will certainly help.

HOWARD W. LUNDY, Dr.P.H.  
Head, Health Education Section,  
State Department of Health,  
Seattle, Wash.

September 9, 1947

## BOOKS AND REPORTS

*All reviews are prepared on invitation. Unsolicited reviews cannot be accepted. All books reviewed in these columns may be purchased through the Book Service.*

An Appraisal Method for Measuring the Quality of Housing. Part II. Appraisal of Dwelling Conditions. *New York: American Public Health Association*, 1946. 246 pp. Price, \$5.00.

The Committee on the Hygiene of Housing presents Part II of a yardstick for health officers, housing officials, and planners, this contribution, prepared by Allan A. Twichell, being divided into three volumes: (a) survey director's manual, \$2.50; (b) field procedures, \$1.00; (c) office procedures, \$2.00. The broad purposes of a housing survey have been previously presented in Part I, *Nature and Uses of the Method*. A third part, in preparation, will deal with the appraisal of neighborhood environment.

As stated in a foreword by Rollo H. Britten, Chairman, Subcommittee on Appraisal of Residential Areas, these manuals are intended to facilitate a local survey to be undertaken in association with consulting service provided by the committee. It is hoped, however, that such service will encourage the maintenance of a continuous inventory of local housing conditions. The director's manual carries the reader through each detail of the survey, from the organization of the sponsoring community and the preparation of the survey staff, through a description of the appraisal items, to the collection of data, processing of records in the office, to final analyses and interpretations. Nothing has been left to the imagination of the student of survey methodology. Each detail has been presented in elementary school fashion, undoubtedly for the sake

of uniformity, understanding, and in order to serve as equipment for the surveyor of limited schooling. It will be interesting to note whether much of the text can be consolidated as more field experience is at hand. The manuals are well done and should prove useful tools for every health administrator and teacher interested in housing, and this should include every one of us. Appreciation is again due to Winslow and the members and able staff of his excellent committee. HENRY F. VAUGHAN

Microbial Antagonisms and Antibiotic Substances—By Selman A. Waksman. (2nd ed.) *New York: The Commonwealth Fund*, 1947; 415 pp. Price, \$4.00.

The need for a book like *Microbial Antagonisms and Antibiotic Substances* was well indicated when the first edition of this work went through two printings in the year that it appeared on the market. In this second revised and enlarged edition the table of contents is identical with that of the first edition.

The ecology of the microbic antagonisms native to soil and water is fully discussed in a manner that is logical, clear, and interesting. However, the book attempts to coordinate over a thousand references, and thus appears cumbersome, and in places is stilted and repetitious. Progress in this field is so rapid that almost any book on the subject would be in some respects obsolete at publication. The book can hardly be recommended for its discussions of the chemical and medical aspects of the subject. No reference is made to chemical methods employed for the deter-

mination of penicillin and streptomycin. Frequently references are used without much analysis. It is stated on page 204 that barium salt of penicillin is generally used when common knowledge recognizes barium salt as extremely toxic. On page 206, where the formulae of the penicillins are presented a little addition would give molecular weights from 312-350 instead of the weights 490-510 noted on page 207; the latter are early estimations from an outdated reference. On page 241 Dr. Waksman doubts that streptomycin could be inactivated by blocking a single group, the carbonyl group, in so large a molecule, while larger molecules are known to have been inactivated by merely reversing the direction of optical rotation to a plane of polarized light.

The book, however, contains much information of historical and current interest on antibiotic substances and microbic antagonists; its copious references date from 1863 to 1946. It will be profitably read by the scientific minded person interested in these topics. Experts will find the information useful if regarded critically, and others will be skillfully introduced into the field and brought up to date (1946).

K. F. MEYER

**Nutrition in Industry**—By Lionel Bradley Pett, Robert S. Goodhart, and David H. Blueloch, with an introduction by Frank G. Boudreau. Montreal: International Labour Office. *Studies and Reports*, No. 4, 1946. 177 pp. Price, \$1.50.

The International Labour Office which issues from time to time special reports on subjects which affect industry and labor has performed a real service by publishing in this book accounts of the steps taken in three countries (Great Britain, United States, and Canada) to safeguard the nutrition of industrial workers during the recent war.

The type of warfare of World War

II soon made it evident that the outcome would depend as much on the ability to produce and transport vast armaments as on operations in the field. This, in turn, demanded that the health, morale, efficiency, and welfare of industrial workers be maintained at an optimum. In this connection, all three governments developed active nutritional programs.

In addition to contributing to the maintenance of a high level of industrial production and the development of in-plant feeding organization, these programs helped to supply more precise information on the relation of diet and nutrition to health and working efficiency and to the nutritional status of the worker.

The benefits both as to health and to labor-management relationships of this wartime activity are so generally recognized by employer and labor that the provision of an opportunity to obtain meals at the place of employment is rapidly becoming an integral part of the pattern of American industrial society. This book summarizes the experience in this field to date. OTTO A. HENRI

**School Health Problems**. By Laurence B. Chenoweth, M.D., and Theodore K. Sellink, M.D. (3rd ed.), with an Outline on School Health Administration by Richard Arthur L. New York: F. S. Crofts & Co., Inc. 419 pp. Price, \$3.00.

This book was first published in 1937 "to acquaint students of education, teachers in service, and others interested, with the broad general field of health problems in schools." The second edition published in 1946 is almost identical with the first. The new treatments and new subjects mentioned, are given in detail. There is only brief reference to Swander's work and then only in relation to the ability of teachers to select children for medical examination.



school nurse or physician. The Wetzel Grid also is inadequately discussed in the text, although a brief description of the technique is given in the appendix.

The chapters on growth are perhaps the best feature of the book. Five chapters dealing with growth and nutrition constitute about a quarter of the publication. A large bibliography accompanies most of the chapters. Unfortunately, many of the references are now more than twenty years old. If the authors would substitute for these older publications recent contributions of significance, the value of the book for new readers would be enhanced.

There is insufficient discussion of rheumatic fever. Some of the medical theory appears dated—for example, abscessed teeth are mentioned as an important factor in the development of heart disease and rheumatic fever. In a publication directed to non-medical workers, the glands of internal secretion are reviewed in too much technical detail and out of proportion to their importance as health problems in school children. The description of epilepsy is unfortunate and will tend to create a more pessimistic attitude among educators with respect to the education of these children.

Teachers, nurses, and others concerned with the school child have need for a volume which will orient them to the health problems of school children. *School Health Problems* helps but does not fully meet this need.

GEORGE M. WHEATLEY

**Social Aspects of Public Housing: An Evaluation of North Carolina Experience** — By Sanford Winston. Raleigh, N. C.: North Carolina Council of Housing Authorities, 1947. 44 pp.

This is the report of a sociological study of 194 white and 112 Negro families who have lived in public housing projects in one or another of 6 different North Carolina cities. All subsequently

moved to other homes. Data are presented on family size, occupations of husbands, education of householders, sanitary conditions of dwellings from and into which they moved, and social interests of the group.

It is evident that for this group of families, tenancy in public housing has raised their standard of living to such an extent that they have sought and obtained privately-owned quarters which are far superior to the slums whence they originated.

M. ALLEN POND

**The Murine Type of Tubercle Bacillus.** (The Vole Acid-Fast Bacillus)—By A. Q. Wells. With *Notes on the Morphology of Infection by the Vole Acid-Fast Bacillus*—By A. H. T. Robb-Smith. Medical Research Council Special Report Series. No. 259. New York: British Information Services, 1946, 48 pp. Price, \$.70.

A very complete survey of the knowledge to date concerning the vole acid-fast bacillus is contained in this report. A description is given of the disease as it occurs in voles and its similarity to tuberculosis.

Morphologically the bacillus is notably pleomorphic with the majority of the bacilli bent in various forms. It is strongly acid-fast and grows best on media without glycerine. Serologically it is indistinguishable from the human and bovine types. A tuberculin can be prepared from the vole bacillus which gives reactions in animals infected with the human or bovine tubercle bacilli, and animals infected with the vole bacillus show a sensitivity to human and bovine tuberculin.

The pathogenicity for various laboratory animals, such as the guinea pig, rabbit, white mouse, golden hamster, and other voles is given. When administered in large doses to laboratory animals it can produce progressive disease indistinguishable histologically from

that produced by the human and bovine types of tubercle bacillus. In view of this fact and its characteristic morphology, cultural needs, and pathogenicity, it must, therefore, be considered as a third mammalian type of tubercle bacillus.

Detailed description of experiments and protocols are given demonstrating increased resistance by vaccination of animals with the vole bacillus to subsequent infection with virulent tubercle bacillus. It is concluded that in man immunization with the vole bacillus has proved to be safe and the local reaction resulting is similar to that following BCG vaccination. Tuberculin allergy following vaccination in man with the vole bacillus is greater and occurs earlier than that following BCG vaccination. It has not so far been possible to evaluate the degree of resistance that can be induced in man.

A description is given by Robb-Smith of the lesions observed in relation to the number of organisms present in different tissues from naturally infected voles, as well as in experimentally infected rabbits, guinea pigs, and white mice. Lesions also produced in the vole by artificial infection with human and bovine type tubercle bacilli are described. Many illustrations accompany the descriptions.

The whole report is given in a conservative manner, which is convincing of the possible application of human vaccination with the vole bacillus. The need for further investigation in this phase is clearly indicated.

FLORENCE B. SEIBERT

**Our Rural Communities — A Guidebook to Published Materials on Rural Problems —** By Laverne Burchfield. Chicago: Public Administration Service, 1947. 201 pp. Price, \$2.50.

As its title indicates, this is a source book for those who are dealing with

any of the various aspects of rural social problems such as health, welfare, housing, land use, recreation, library service, etc. There is a general bibliography as well as a special bibliography following each of the 13 chapters.

The public health worker will be interested not only in the chapter on medical care and health services, but in the other chapters as well, because taken together, they give a bird's-eye view of the fact that no one of the problems is isolated. Land use, for example, is related to schools and health; local government is related to each of the problems.

The book is interesting for another reason. It originated in the work of a committee of the American Country Life Association following its 1944 conference on farm and rural life after the war. It is thus an illustration of the way in which a group saw its own need and met that need.

MARTHA LUGINBUHL

**The Papworth Families: A 25 Years Survey—** By E. M. Brieger. New York: Grune & Stratton, 1946. 674 pp. Price, \$12.00.

This book is a report of the dwellers in the Papworth Settlement, drawn up thirty years after the initiation of that experiment. It analyzes in considerable detail the history of the 142 families, and particularly of the 368 children of these families who were kept under constant supervision while at the settlement.

Although no case of active tuberculosis, and no case of active primary infiltration has been observed in the 108 children born at Papworth, Dr. Brieger admits there is no guarantee against exacerbations in later adult life.

The data are presented in numerous sub-divisions by place of birth of the children, by sputum of the original patient, by size of family, and other factors, all of which provide an invaluable epidemiological reference.

The book contains an interesting historical review of the beliefs held at various times as to the communicability of tuberculosis. The appendix, giving details of the case histories of all families, provides added data which many will value.

Environment, particularly as it affects security and prevention of exposure to massive infection, is, according to Dr. Brieger, the lesson in tuberculosis control taught by the Papworth experiment.

JAMES G. STONE

Standard Methods of the Division of Laboratories and Research of the New York State Department of Health—By Augustus B. Wadsworth, M.D. Baltimore: Williams & Wilkins, 1947. 990 pp. Price, \$10.00.

This storehouse of information of public health laboratory methods has been an essential reference book in public health laboratories since the publication of the first edition in 1927. In this third edition Dr. Augustus B. Wadsworth culminates a career of thirty-three years of noteworthy contributions to medicine and public health as Director of the laboratories of the New York State Department of Health and brings up to date the procedures and techniques developed during his one-third century as Director of that laboratory. The general format of past editions is retained. Through 75 chapters detailed descriptions are given of all techniques and procedures currently employed in the highly developed and efficient New York State laboratory system.

This edition contains numerous changes and additions. Noteworthy among these is the method for the preparation and use of the new cardiolipin antigen in the serodiagnosis of syphilis, which has been developed in the New York State laboratories since the publication of the second edition. A chapter is added on biologic assay,

and numerous changes and additions are to be found in other sections. The appendix provides excerpts from the *State Law and Sanitary Code* relating to laboratories and gives procedures for the submission of specimens. The importance of these latter details is well recognized by all workers in public health laboratories.

The book is well printed and is bound to withstand the hard usage of the laboratory. It is replete with bibliographical references that further enhance its value.

This edition should be available for ready reference in every public health laboratory. It will also be found to be of value to any public health workers who depend upon the laboratory for assistance in the solution of their problems.

MALCOLM H. MERRILL

Tuberculosis Nursing—By Grace M. Longhurst, R.N. (2nd. ed.) Philadelphia: Davis, 1947. 358 pp. Price, \$3.50.

This second edition of *Tuberculosis Nursing*—which has become a valuable nursing library item—has several new chapters as well as many timely revisions. One chapter titled "Patient Education" is especially helpful. It gives specific suggestions for teaching in relation to many of the factors involved in tuberculosis nursing; it suggests opportunities when this teaching will have its greatest value to the patient and/or his family and it hints of teaching aids which will supplement day-by-day teaching.

The chapters of Case Histories also suggest methods of approach to particular problems which are found repeatedly among tuberculous patients. The detail of "Method of handling the patient and his problem" could have been made more meaningful. A student might profit more from a detailed reporting of the actual, practical plan undertaken than by the statement that

"An appeal has been made to her superior intelligence" or that "a patient of this type needs to be reassured constantly."

In view of the fact that Miss Longhurst feels that nurses should be able to explain the "How, Why and When" of the disease, it seems unfortunate that clinical tuberculosis is not dealt with more fully. An intimate understanding of the qualitative classification of tuberculosis is important—as well as the quantitative classification—if the nurse is to do as intelligent and effective job as we expect. This kind of information would seem to be more vital than the many pages given over to the specifics of procedure and technique. Undeniably the nurse needs to be familiar with the principles of a safe technique but the institution in which she works will no doubt have established procedures.

The recommended readings and questions suggested for review at the end of each chapter are comprehensive and should be useful to the teacher or student of tuberculosis nursing.

ALINE LEMAT

*Clinical Practice in Infectious Diseases*—By E. H. R. Harries and M. Mitman. (3rd ed.). Written and printed in Great Britain. American Publishers: Baltimore. Williams & Wilkins, 1947. 679 pp. Price, \$4.50.

The authors of this excellent book are medical superintendents of English hospitals who have evidently had extensive clinical experience in the management of the various contagious diseases. Besides 8 introductory chapters on the general principles of infection and of diagnosis, and 4 concluding chapters on the management of infectious diseases under varying circumstances, there are 26 chapters discussing various of these diseases, but there are no accounts of such other contagious diseases as syphilis, gonorrhea, or

the common cold. In general the description of the maladies and of their complications, prevention, and treatment are concise, accurate, and up-to-date; and there are many helpful diagrams, charts, and tables, but no photographs—colored or otherwise—of the actual conditions. Many of the chapters have bibliographies appended but the titles of the references are not given, thereby losing much of the value of such bibliographies. There are a number of minor matters in which British custom and procedure evidently differ from American, but nothing of particular moment was found except the recommendation of codein and barbiturates for acute poliomyelitis—drugs which are contraindicated because of the danger of the patient's stopping breathing during artificially produced sleep. On the whole, the book can be very highly recommended, particularly to medical students.

PHILIP M. STIMSON

*Manual for Sewage Plant Operators*—By L. C. Billings, Editor-in-Chief. Austin: Texas Water Works Short School, 1946. 426 pp. Price \$3.50.

The Editor's Preface contains as good an explanatory statement as any in stating, "It (the *Manual*) represents an effort of the State Association to bring together practical knowledge and experience in such co-ordinated form as will serve as a text for instruction to those interested in the operation of sewage plants and sewerage systems." The non-technically trained, operational individual will find this volume particularly useful. Consideration of theory is held to a bare minimum. The *Manual* starts with a discussion of general characteristics and significance of sewage and progresses through the various factors involved in treatment. Technical terms, where used, are explained.

FRANCIS B. ELDER

Statistical Abstract of the United States, 1946—Compiled under the supervision of Morris H. Hansen, U. S. Department of Commerce, Bureau of the Census. Washington: U. S. Government Printing Office, 1946. 1,039 pp. Price, \$2.25.

This 67th annual edition of the *Statistical Abstract*, like previous editions, contains summary information from important statistical publications in the United States. Thirty-four sections of the volume deal with statistics of area, population, vital statistics, criminology, climate, military affairs, business and finance, industry (including agriculture), public works, transportation and communication, and foreign commerce. Because of the wide scope of the volume, information is largely restricted to data for the nation as a whole and for the states. The material is well annotated, however, so that the user of the *Abstract* can refer to original sources of data for additional detail. Public health personnel will find this volume useful not so much for vital statistics and population data (since they are more likely to use the primary sources for these subjects), but for the occasional use of statistics in other fields and for the "Bibliography of Sources of Statistical Data" at the

end of the volume. The *Abstract* is an important adjunct to the library of a statistician working in any field.

EILEEN W. JONES

Units in Personal Health and Human Relations — By Lillian L. Biester, William Griffiths, and N. O. Pearce, M.D. Minneapolis: Minnesota Press, 1947. 267 pp. Price, \$3.50.

Educators who believe that sex education should be part of education for living will welcome this volume. It was prepared as a guide to group discussion and contains basic facts for teachers which will enable them to present material on reproduction and its social factors adequately.

The authors suggest that the material should be integrated with other subjects such as science, home economics, and health education to obtain effectiveness and a wholesome approach.

Teacher training institutions might well use this book for group discussions for those who expect to be guides to youth. The weakness in teaching the subject at the present is the lack of teacher preparation.

References used are sound and the accompanying vocabularies are explained. It is a useful volume.

MARY P. CONNOLLY

## BOOKS RECEIVED

*Listing in this column acknowledges the receipt of books and our appreciation to the senders. Space and the interests of readers will permit review of some, but not all, of the books listed.*

AMERICA'S NEEDS AND RESOURCES. By J. Fredric Dewhurst. New York: Twentieth Century Fund, 1947. 812 pp. Price, \$5.00.

THE CARE AND TREATMENT OF THE ELDERLY AND INFIRM. Report of a Special Committee of the British Medical Association. London: British Medical Association, 1947. 28 pp. Price, \$15.

CALCIUM AND PHOSPHORUS IN FOODS AND NUTRITION. By Henry C. Sherman. New York: Columbia University Press, 1947. 176 pp. Price, \$2.75.

CONCISE CHEMICAL AND TECHNICAL DICTIONARY. Edited by H. Bennett. New York: Chemical Publishing Co., 1947. 1,055 pp. Price, \$10.00.

CITY FINANCES: 1945 (Cities Having Populations over 25,000). Prepared under the supervision of Allen D. Manvel. Washington, D. C.: Supt. of Documents, U. S. Gov. Ptg. Office, 1947. 258 pp. Price, \$1.25.

COLLOID SCIENCE—A SYMPOSIUM. By E. K. Rideal, A. E. Alexander, D. D. Eley, P. Johnson, F. Eirich, R. F. Tuckett, J. H.

- Schulman, M. P. Pertuz, G. S. Adair, G. B. B. M. Sutherland, and R. R. Smith. New York: Chemical Publishing Co., 1947. 208 pp. Price, \$6.00.
- DENTAL HEALTH PROGRAM FOR ELEMENTARY AND SECONDARY SCHOOLS. American Dental Association. Chicago: The Council on Dental Health, 1947. 40 pp.
- THE DEVELOPMENT AND CONDUCT OF A MEDICAL CENTER AND HEALTH PROGRAM. Report to Social Security Commission of the Garment Industry. St. Louis: Ross Garrett and Associates, 1947. 75 pp.
- DYNAMIC MENTAL HYGIENE. By Ernest R. Groves and Catherine Groves. Harrisburg, Pa.: Stackpole Sons, 1947. 559 pp. Price \$3.75.
- ELEMENTARY NUCLEAR THEORY. By H. A. Bethe. New York: Wiley, 1947. 147 pp. Price, \$2.50.
- FATIGUE AND IMPAIRMENT IN MAN. By S. Howard Bartley. Ph.D. and Eloise Chute, M.A. Foreword by A. C. Ivy, Ph.D., M.D. New York: McGraw-Hill, 1947. 429 pp. Price, \$5.50.
- 5,000,000 - CASUALTIES ON THE HOME FRONT. By Louise Neuschutz. Foreword by Margaret Culkin Banning. New York: Beechhurst Press, Inc., 1947. 184 pp. Price, \$3.50.
- GENERAL BACTERIOLOGY. By D. B. Swingle, Revised by William G. Walter (2nd ed.). New York: Van Nostrand, 1947. 319 pp. Price, \$3.50.
- GENERAL ZOOLOGY. By Winterton C. Curtis and Mary J. Guthrie (4th ed.). New York: Wiley, 1947. 794 pp. Price, \$4.50.
- HANDBOOK OF PSYCHIATRY. By Winfred Overholser, M.D. and Winifred V. Richmond, Ph.D. Philadelphia: Lippincott, 1947. 252 pp. Price, \$4.00.
- HOSPITAL AND HEALTH DEPARTMENT FACILITIES AND NEEDS IN TENNESSEE. Nashville: Department of Public Health, 1947. Chapters I through IV inclusive.
- HOSPITAL AND PUBLIC HEALTH RESOURCES IN NEW JERSEY. Trenton: State of New Jersey Department of Institutions and Agencies, 1947. 114 pp.
- HOW OUR MINDS WORK. By C. E. M. Joad. New York: Philosophical Library, 1947. 116 pp. Price, \$2.75.
- AN INTRODUCTION TO PERSONAL HYGIENE. By Laurence B. Chenoweth. New York: F. S. Crofts, 1947. 345 pp. Price, \$2.50.
- DR. KIRKBRIDE AND HIS MENTAL HOSPITAL. By Earl D. Bond, M.D. Philadelphia: Lippincott, 1947. 163 pp. Price, \$3.50.
- MEDICAL CARE AND COSTS IN RELATION TO FAMILY INCOME. Selected and compiled by Helen Hollingsworth, Margaret C. Klem and Anna Mae Baney (2nd ed.). Washington, D. C.: Supt. of Documents, U. S. Govt. Ptg. Office, 1947. 349 pp. Price, \$1.25.
- THE METROPOLITAN LIFE. By Marquis James. New York: Viking Press, 1947. 480 pp. Price, \$5.00.
- ON HOSPITALS. By S. S. Goldwater, M.D. New York: Macmillan, 1947. 395 pp. Price, \$9.00.
- POSTWAR PROBLEMS OF MIGRATION. Papers Presented at the Round Table on Population Problems at the 1946 Conference of the Milbank Memorial Fund October 29-30, 1946. New York: Milbank Memorial Fund, 1947. 173 pp. Price, \$1.00.
- THE PRACTICAL NURSE. By Dorothy Deming, R.N. New York: Commonwealth Fund, 1947. 370 pp. Price, \$3.00.
- PROBLEMS OF EARLY INFANCY. Transactions of the First Conference March 3-4, 1947, New York, N. Y. New York: Josiah Macy, Jr. Foundation, 1947. 69 pp. Price, \$.75.
- PSYCHIATRY FOR EVERYMAN. By J. A. C. Brown. New York: Philosophical Library, 1947. 247 pp. Price, \$3.00.
- PUBLIC HEALTH LAW. By James A. Tobey, Dr.P.H. (3rd ed.) New York: Commonwealth Fund, 1947. 419 pp. Price, \$4.50.
- A PUBLIC HEALTH SURVEY OF SARATOGA COUNTY, NEW YORK 1945-1946. By Gert-rude E. Hodgman, R.N. Saratoga Springs, N. Y.: Saratoga County Tuberculosis and Public Health Association, 1947. 136 pp.
- READING AND VISUAL FATIGUE. By Leonard Carmichael, Ph.D. and Walter F. Dearborn, Ph.D. Boston: Houghton Mifflin, 1947. 483 pp. Price, \$5.00.
- SPEECH CORRECTION FOR PARENTS AND TEACHERS. By Willard M. Wood. Watertown, N. Y.: The Watertown Press, 1947. 109 pp. Price, \$2.75.
- THE SHIP'S MEDICINE CHEST AND FIRST AID AT SEA. Joint Project of the U. S. Public Health Service and the War Shipping Administration (rev. ed.). Washington, D. C. U. S. Govt. Ptg. Office, 1947. 498 pp. Price, \$3.50.
- TELL GIRLS WHY. By Helen McLarin Black-welder. Atlanta: Turner E. Smith, 1947. 98 pp. Price, \$1.75.
- TRAINING IN CLINICAL PSYCHOLOGY. Transactions of the First Conference March 27-28, 1947. New York, N. Y. New York: Josiah Macy, Jr. Foundation, 1947. 88 pp. Price, \$1.50.
- VOLUNTARY PREPAYMENT MEDICAL CARE PLANS. Council on Medical Service (rev.) Chicago: American Medical Association, 1947. 93 pp.

## A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

**Diphtheria Can Be Eliminated, It Says Here—**Diphtheria deaths continue to increase. New England cities had the worst record, those in the East South Central group of states the best.

ANON. Diphtheria Mortality in large Cities in the United States in 1946. *J.A.M.A.* 134, 18:1540 (Aug. 30), 1947.

**Despite Skeptic's Opinion—**This committee seems to have produced a thorough-going re-statement of the whole rabies control story. Probably the one finding that will stick in your crop is the assurance that earlier doubts about the efficacy of canine vaccines can now be laid to rest. The extreme ultra-violet irradiated vaccine really does the trick, they assure us. There are eleven recommendations for rabies control proposed by the committee.

ANON. Control of Rabies. *Pub. Health Rep.* 62, 34:1215 (Aug. 22), 1947.

**Coöperative Planning Is Their Answer—**Thumbing through the abstracts of eight viewpoints on the matter of school child health leaves the impression that the Canadian-USA border separates few differences in the overall administrative problems or in the usual community deficiencies in meeting them.

ARMYOT, G. F., *et al.* School Health Services. *Canad. Pub. Health J.* 38, 8:361 (Aug.), 1947.

**The Need Is Indisputable—**Milwaukee, Detroit, Los Angeles, and Baltimore Health Departments have made a stab at getting rid of sub-standard housing and substituting decent human dwelling places. Let's see; how

many American cities over 100,000 are there?

BOARD, L. M. The Local Health Department Program in Housing. *Pub. Health Rep.* 62, 37:1327 (Sept. 12), 1947.

**Quote—**The greatest event in English medicine, the birth of the National Health Service, has passed into history. Gestation was prolonged and often complicated, labor quick and uneventful, and now the baby grows apace. Unquote. For the health people, a new era begins: it is the era of specialism in preventive medicine.

BROCKINGTON, F. Letter from Great Britain. *Canad. Pub. Health J.* 38, 8:401 (Aug.), 1947.

**Papers-of-the-Month—**We have at long last an opportunity to cope on a broad, nation-wide scale with America's major public health problem—mental illness. So begins a discussion of the practical measures for the attack. If you are not sufficiently interested in what's to be done to read one of these papers, then you are too parochial minded for your own good.

FELIX, R. H. State Planning for Participation in the Mental Health Act. *Pub. Health Rep.* 62, 33:1183 (Aug. 15), 1947 (and) *The Battle Is Joined. Survey Midmonthly* 83, 9:235 (Sept.), 1947.

**Slogans De-Watered —**Something more is required than cheap, worn out slogans which are unconvincing and untrue, insists this British M. O. H. There really are advantages in breast feeding which are both convincing and true—he says. Incidentally, I wish more American health workers could and

would read the Health Education Journal. It's quite a periodical—and so very British.

GEFFEN, D. H. Science of Breast Feeding. Health, Ed. J. 5, 3:101 (July), 1947.

Another Epidemiologic Uncertainty—Textbooks set the incubation period for polio at 6–12 days, averaging 10. These figures are not well established, say the writers. Intervals between apparent exposure and onset vary from 3 to 35 days. Many factors need to be settled before we shall have exact knowledge, they conclude.

HORSTMANN, D. M. and PAUL, J. R. The Incubation Period in Human Poliomyelitis and Its Implications. J.A.M.A. 135, 1:11 (Sept. 6) 1947.

First, Choose Parents With Good Teeth—Children continuously drinking fluoride containing water are protected against caries but the degree of protection varies. Youngsters whose parents have the most dental disease are protected the least. It seems that familial susceptibility must be reckoned with in judging the beneficent effects of exposure to fluorine.

KLEIN, H. The Family and Dental Disease. Pub. Health Rep. 62, 35:1247 (Aug. 29), 1947.

Eight Years After—Evidence is presented here to suggest that people generally are continuing to improve in the matter of prompt action when they suspect cancer. Family physicians are not making comparable progress. In over 80 per cent of the patients studied, a diagnosis of cancer could have been made by the first physician if only he had made a careful history and physical examination. Has public health a bigger job to do here?

LEACH, J. E. and ROBBINS, G. F. Delay in the diagnosis of Cancer. J.A.M.A. 135, 1:5 (Sept. 6), 1947.

Men at Work—Did you know that for twenty years the U.S.P.H.S. has

maintained a venereal disease research laboratory on Staten Island? All sorts of interesting studies have been undertaken in the fields of diagnosis, prophylaxis, and therapy.

MAHONEY, J. F. Some Significant Aspects of Venereal Disease Research. Ven. Dis. Inform. 28, 7:129 (July), 1947.

Out of the Mouths, Et Cetera—School Children were asked to list the subjects taught in order of their preferences. Hygiene was promptly condemned to outer darkness, along with grammar and another deadly subject tabbed memory gems. One candid tile wrote, "I dislike hygiene because it is so boring." Brings back your own youth, doesn't it?

MONASH, L. Why Children Dislike School. Understanding the Child. 16, 3:67 (June), 1947.

Barber Shops Spread It Too—When community outbreaks of *Tinea capitis* occur—and they do occur often—half-way measures are not likely to fill the bill. The U.S.P.H.S. control method has nineteen steps, and it works.

SCHWARTZ, L. Public Health Aspects of the Treatment of *Tinea capitis*. New York State J. Med. 47, 16:1782 (Aug. 15), 1947.

In Return for His "Stamp"—In preparation for the (British) National Health Service, local authorities are busily arranging their schemes for home nursing care of the insured patient. These services may be given by health department nurses or through arrangements with voluntary nursing organizations. Many of us will be curious about the outcome of the different methods.

WARR, K. Public Health Nursing in England. Pub. Health 57, 1:1 (Sept.), 1947.

Educational Job To Do—In a typical community a public health survey revealed 3 unsuspected cases of cancer for every 4 known cases. If the proportion held generally the public health



be much more prevalent than is commonly assumed. Case finding methods are reviewed.

WILKERSON, H. L. C. and KRALL, L. P. Diabetes in a New England Town. J.A.M.A. 135, 4:209 (Sept. 27), 1947.

**First, Be Sure**—Today the water works operator uses alum, chlorine, copper, iodine, halozone, iron, metaphosphates, sulfuric acid, carbonic acid, and sulfur to make safe and acceptable community water supplies. It has been urged that, in addition to purification we medicate water supplies with iodine

and fluorine. Iodine was tried and abandoned. Fluorine is being added experimentally in a number of communities. Wolman, Geiger, and Morse say that we should wait until the controlled experimentation is completed before going further. Morse suggests that it is questionable economy to medicate 100 gallons of water for the sake of the single gallon the residents will drink.

WOLMAN, A., *et al.* Should Public Water Supplies Be Used for Mass Medication? J. Am. Water Works A. 39, 9:834 (Sept.), 1947.

## ASSOCIATION NEWS

### OFFICERS, 1947-1948

*President*, Martha M. Eliot, M.D., Washington, D. C.

*President-Elect*, Charles F. Wilinsky, M.D., Boston, Mass.

#### *Vice-Presidents:*

G. D. W. Cameron, M.D., D.P.H., Ottawa, Ont., Canada

J. P. Fontenelle, M.D., Rio de Janeiro, Brazil

Emilie Sargent R.N., Detroit, Mich.

*Treasurer*, Louis I. Dublin, Ph.D., New York, N. Y.

*Executive Secretary*, Reginald M. Atwater, M.D., New York, N. Y.

*Chairman of Executive Board*, Abel Wolman, Dr.Eng., Baltimore, Md.

#### *New Members of Executive Board:*

Estella Ford Warner, M.D., Washington, D. C.

George M. Uhl, M.D., Los Angeles, Calif.

### THE A.P.H.A. ANNOUNCES AN INCREASE IN DUES

At the Atlantic City Annual Meeting the Governing Council approved amendments to the By-laws providing for an increase in dues for the various grades of membership in the Association. This step was reluctantly taken to meet the rising costs of printing the *American Journal of Public Health* and furnishing other services to members. In recommending the dues increases, the Governing Council took cognizance of the fact that the membership dues have remained at \$5 since the Association was established in 1872 and that the Fellowship dues have been kept at \$10 since this grade of affiliation was established in 1922.

As of October 10, and effective with the calendar year 1948, the annual dues for members will be \$7, for Fellows \$12, and for a subscription to the *American Journal of Public Health*, \$7. The new rate for Life Membership will be \$200.

As a convenience to any members or Fellows who may wish to apply for Life Membership before the new rate goes into effect, the Governing Council ruled

that such persons may have until December 31, 1947, to apply. Applications for Life Membership which are received up to that date and accompanied by an initial payment of \$25 will be accepted at the \$100 rate. Upon applications for Life Membership received in the Administrative Office after December 31, 1947, the new rate will apply.

With the additional revenue that is obtained from the increased dues the Executive Board plans to expand the *American Journal of Public Health* and reestablish the *Year Book*, absorbing the recent 45 per cent increase of printing costs. In addition, the Board will attempt to meet at least in part the urgent requests for funds from the Association committees dealing with such vital matters as the recruitment and placing of engineers, physicians, and laboratory workers. There are requests for field services of A.P.H.A. staff from coast to coast which would require the entire increase of Association income from the change of dues.

The Governing Council acted on

recommendation of the Executive Board and the Committee on Eligibility after conducting an opinion poll which showed that the reasons behind the change were widely understood by the

membership. Among professional societies the A.P.H.A. is unique in having deferred this change until 1948, in which year several similar groups are raising dues a second time.

## APPLICANTS FOR MEMBERSHIP

*The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.*

### *Health Officers Section*

- Shirley Benham, Jr., M.D., M.P.H., 215 W. 14th, Port Angeles, Wash., Health Officer, Olympia Health District
- Robert S. Easton, M.D., 609 City-County Bldg., Pittsburgh, Pa., Director, Tuberculosis Control Division, Dept. of Health
- Edward J. Fitzgerald, M.D., 65 Ridge St., Glens Falls, N. Y., Health Officer, City of Glens Falls
- John M. Huff, M.D., Municipal Bldg., Norfolk, Va., Director, Dept. of Health
- Raymond F. Kaiser, M.D., National Cancer Institute, Bethesda, Md., Asst. Chief, Cancer Control, Subdivision, U. S. Public Health Service
- R. H. Laning, M.D., Health Office, Amherst, Va., Health Officer
- Rodrigue Latourelle, M.D., D.P.H., 7—St. Laurent, Louiseville, Que., Canada, Health Officer, Health Unit
- Leonard Maidman, M.D., Wilton, Conn., Health Officer
- Perry F. Prather, M.D., Health Dept., Hagerstown, Md., Deputy State Health Officer, Washington County, State Dept. of Health
- Rollin A. Raymond, 3733 N. Arkansas, Wichita, Kan., Exec. Secy., Kansas Crippled Children Commission
- Paul Richmond, Jr., M.D., 476 Main St., Worcester, Mass., District Health Officer, State Dept. of Public Health
- Francois F. Rougon, M.D., New Roads, La., Director, Pointe Coupee Parish Health Unit
- Lawrence L. Spitzer, M.D., 209 S. Campbell St., El Paso, Tex., Public Health Physician, El Paso City-County Health Unit
- R. L. Tuli, M.B., D.P.H., D.T.M., New Colony, Nagpur, C. P. & Berar, India, Director of Public Health, Government Public Health Dept.
- Harold R. Vogel, M.D., 637 City-County Bldg., Pittsburg 19, Pa., Director, Pittsburgh Syphilis and Venereal Disease Control Program

Camillo E. Volini, M.D., 4022 Sheridan Rd., Chicago, Ill., Supt. of Clinics, Municipal Tuberculosis Sanatorium

### *Laboratory Section*

- Louise Baker, M.A., 918 Grove St., Elmira, N. Y., Head Bacteriologist, Arnot-Ogdon Memorial Hospital
- Merle P. Baker, Ph.D., Dairy Industry Dept., Iowa State College, Ames, Iowa, Teacher of Dairy Bacteriology
- Mary Leigh Beach, 1800 N. Edison St., Arlington, Va., Director of Laboratory, Arlington County Health Dept.
- Eleanor M. Beckman, 1098 W. Michigan, Indianapolis, Ind., Public Health Trainee, State Board of Health
- Albert M. di Gioia, 350 Post St., San Francisco, Calif., Director, San Francisco Polyclinic
- Malcolm K. Dulaney, 410 E. 5th, Austin 2, Tex., Asst. Immunologist, Biologics Division, State Health Dept.
- William G. Godbey, P. O. Box 428, Weslaco, Tex., Director of Laboratory Division, Engineering Service and Sales Co.
- Venton R. Harrison, Wye Ave., Easton, Md., Assoc. Bacteriologist, Branch Laboratory, State Dept. of Health
- Carolyn J. Irwin, 610 Felder Ave., Montgomery, Ala., Assoc. Bacteriologist, State Dept. of Public Health
- Helen J. Kearney, 2824 Prince St., Berkeley 5, Calif., Student, Univ. of California
- Janice B. McLeod, 2116 Durant Ave., Berkeley 4, Calif., Student, Univ. of California
- James A. McDonald, Box 94, Woodlawn Hills, Calif., X-ray Technician, Laboratory
- John H. McGinness, Otisville, N. Y., Junior Bacteriologist, Municipal Sanatorium, Dept. of Hospitals, New York City
- Wanda C. McGuire, 2960 Broadway, Indianapolis, Ind., Bacteriologist, State Board of Health
- Jay D. Myers, 1765 W. 50th St., Los Angeles

37, Calif., Clinical Laboratory Technician, Los Angeles Sanatorium  
 Iris Myers, 4705 E. 35th St., Indianapolis, Indiana, U. S. Public Health Trainee, State Board of Health  
 Z. John Ordal, Ph.D., Guardian Bldg., St. Paul 1, Minn., Chief, Bacteriology Section, Research and Development Division, Economics Laboratory, Inc.  
 Luis V. Pascual y Carol, M.D., Calle No. 9, N. 254, Havana, Cuba, Asst. Director, Laboratorio Biologico, Columbia, Mariane, Cuba  
 Keith L. Sessions, 280 B. St., Salt Lake City, Utah, Junior Serologist and Bacteriologist, State Health Dept.  
 Maurice Steinmetz Tarshis, M.S., U. S. Veterans Hospital, Clinical Laboratory Division, Walla Walla, Wash., Medical Bacteriologist, In Charge of Clinical Laboratory  
 Kathryn Teeple, Campana de Bananera, Costa Rica, For Quepos, Medical Dept., San Jose, Costa Rica, Chief Medical Technologist, United Fruit Company Hospital  
 Louise M. Ward, M.P.H., State Laboratory of Hygiene, Raleigh, N. C., Assoc. Bacteriologist  
 Helen E. Woolley, 4038 Gladys Ave., Chicago 24, Ill., Senior Bacteriologist, Chicago Board of Health Laboratories

#### *Vital Statistics Section*

Harold A. Kahn, 3530 39th St., N. W., Washington 16, D. C., Biostatistician, U. S. Public Health Service, Venereal Disease Division  
 Sarah L. Malisoff, 2124 Eye St., N. W., Washington, D. C., Analyst, Marriage and Divorce, U. S. Public Health Service  
 Edward E. Schwartz, M.A., R. F. D. 1, Alexandria, Va., U. S. Children's Bureau, Director, Division of Statistical Research  
 Daniel D. Swinney, M.A., 2706 Holly St., Alexandria, Va., Public Health Administrator, Division of Public Health Methods, U. S. Public Health Service  
 John D. Thewlis, M.S., Division of Hospital Facilities, U. S. Public Health Service, Wash., D. C., Chief, Statistical Services Section

#### *Engineering Section*

Langdon B. Backus, Brownsville, Md., Research Secy., Philadelphia Tuberculosis and Health Assn.  
 Paul L. Brooks, 34 South St., Middletown, N. Y., District Milk Sanitarian, State Dept. of Health  
 Wade E. Eller, Boone, N. C., Sanitarian,

Alleghany-Ashe-Watauga District Health Dept.  
 Reamy C. Fitch, P. O. Box 1226, Phoenix, Ariz., Senior Sanitary Engineer, Sanitary Engineering Division, State Board of Health  
 Andrew J. Glenn, 23 Charlton St. East, Savannah, Ga., Sanitary Engineer, Savannah-Chatham County Health Dept.  
 William A. Hansell, Jr., Health Dept., Griffin, Ga., Public Health Engineer, Spalding-Lamar-Pike Tri-Unit Health Dept.  
 Kerwin L. Mick, M.S., 639 E. 57th St., Minneapolis, Minn., Chief Engineer and Supt., Minneapolis-St. Paul Sanitary District  
 John V. Miner, Jr., Georgia School of Technology, Box 886, Atlanta, Ga., Laboratory Asst. and Student  
 Stuart C. Mount, D.V.M., City Hall, Room 607, Milwaukee, Wis., Milwaukee Health Dept., Bureau of Food and Sanitation  
 Oswald J. Muegge, M.S., 656 Crandall Ave., Madison 5, Wis., Sanitary Engineer, State Board of Health  
 Felix C. Pickron, P. O. Box 129, Albany, Ga., Regional Engineer, State Dept. of Public Health  
 Ray A. Scott, State Dept. of Public Health, 7 B. St. Pier Bldg., San Diego 1, Calif., Supervising Inspector, San Diego District  
 Jack G. Sieg, 114 E. Edwards, Springfield, Ill., Senior Sanitary Engineer, State Dept. of Public Health  
 Charles C. Spencer, 600 W. 168th St., Columbia Univ., New York 32, N. Y., Asst. Professor of Sanitary Science, School of Public Health  
 E. J. Sylvester, 6516 People, New Orleans, La., Director, State Typhus Control, State Dept. of Health  
 John Taylor, M.S., 1098 W. Michigan, Indianapolis 7, Ind., Director, Division of Dairy Products, State Board of Health  
 James W. Wright, 54 Viale Parioli, Rome, Italy, Chief Sanitary Engineer, International Refugee Organization

#### *Industrial Hygiene Section*

Ralph T. Behling, M.D., 1146 Appraisers Bldg., San Francisco 11, Calif., Cancer Control Consultant, U. S. Public Health Service  
 Bertrand Bellemare, M.D., M.P.H., 575 15th St., Limoilou, Que., Canada, Chief, Service de la Medecine du Travail, Ministry of Labor  
 Boris P. Bushueff, M.D., 890 Washington St., Wellesley, Mass., Medical Practice, Internal Medicine and Tuberculosis  
 Elgin D. Sallee, 117 Howard Ave., Hillside, Ill., Supervisor, Industrial Hygiene Group, American Can Co.

Lawrence E. Turner, P. O. Box 594, Prudential Insurance Co., Newark 1, N. J., Underwriting Specialist

#### *Food and Nutrition Section*

Anna M. Banus, M.S., Western Reserve Univ., Home Economics Dept., Cleveland, Ohio, Asst. Professor

Dorothea L. Horstmann, 5 East 98th St., New York 29, N. Y., Dietitian, Mount Sinai Hospital

Elias Malinow, 1324 College Ave., New York 56, N. Y., Health Inspector, New York City Dept. of Health

Elton S. Osborne, Jr., M.D., Nutrition Unit, Post Office Bldg., U. S. Public Health Service, Grand Haven, Mich., Medical Officer in Charge, Nutrition Demonstrations Unit

Myra Reagan, M.S., State Dept. of Public Health, Atlanta, Ga., Nutrition Consultant

Helen Somers, 11 E. 100th St., New York 29, N. Y., Supervising Dietitian, Mount Sinai Hospital

Doris A. Stryker, 11 E. 100th St., New York 29, N. Y., Asst. Dietitian, Mount Sinai Hospital

Mabel V. Todd, M.S., State Board of Health, Raleigh, N. C., Senior Nutritionist, Nutrition Division

#### *Maternal and Child Health Section*

Mary Allen, M.D., 634 E. Garcia, Santa Fe, N. M., Maternal and Child Health Consultant, State Board of Health

Maria L. Donoso-Torres, M.D., Ave. 20 de Octubre 1007, La Paz, Bolivia, S. A.

Marjorie A. Hawkins, R.N., 220 Calvert St., Chestertown, Md., Public Health Obstetrical Nurse, State Dept. of Health

John P. Hubbard, M.D., 2346 Mass. Ave., N. W., Wash., D. C., Director, Study of Child Health Services, American Academy of Pediatrics

Helen F. Streeter, 33 West St., Portland, Me., Speech Consultant, Bureau of Health

Lucille Woodville, R.N., 441 West Peachtree St., Atlanta 3, Ga., Regional Nursing Consultant, Federal Children's Bureau, Social Security Administration, Federal Security Agency

#### *Public Health Education Section*

Albert C. Bickett, 610 S. Canal, Room 852, Chicago, Ill., Administrative Analyst, U. S. Public Health Service

Hester B. Bland, 4946 W. 15th, Indianapolis, Ind., Health Education Consultant, State Board of Health

William C. Bowen, 49 Melrose Ave., East Orange, N. J., State Representative, Na-

tional Foundation for Infantile Paralysis, Inc.

Edwin G. Dewis, M.D., Prudential Insurance Co., P. O. Box 594, Newark 1, N. J., Assoc. Medical Director

Adeline M. Dipene, 378 Van Siclen Ave., Brooklyn 7, N. Y., Health Educator, New York City Dept. of Health

Joseph F. Dowling, Yanktown, S. D., State Representative, National Foundation for Infantile Paralysis, Inc.

Carter V. Ellis, M.P.H., 906 Rugby St., Charleston, W. Va., Public Health Education, State Health Dept.

Alice Grant Grossklaus, 84 W. Main St., Riverhead, N. Y., Health Education Secretary, Suffolk County Tuberculosis and Public Health Assn.

Mrs. Davis M. Harman, 1119 Clement St., Radford, Va., Exec. Secy., Montgomery-Radford Tuberculosis Assn.

James J. Healy, 249 Marlboro Rd., Wood-Ridge, N. J., Field Secy., Pennsylvania Tuberculosis Society

Clarence W. Kehoe, 907 First National Bank Bldg., Springfield, Ill., Director of Rehabilitation, Illinois Tuberculosis Assn.

F. R. Khan, c/o Post Master General, Karachi, Pakistan, India, Chief Sanitary Inspector, Aramco Ras Tanura Saudi Arabia

Myrtle-Ellen LaBarr, Box 1363, Greensboro, N. C., Director of Publicity, North Carolina Division, Field Army, American Cancer Society

Dominic V. Liberti, 4808 South 29th St., Arlington, Va., Public Health Extension Officer, U. S. Public Health Service

John R. Loughlin, 128 W. Commerce St., San Antonio, Tex., State Representative, National Foundation for Infantile Paralysis, Inc.

Lisel Lowen, M.A., 41-12 48th St., Long Island City 4, N. Y.

Manfred M. Mayer, Ph.D., 1739 Eutaw Place, Baltimore 17, Md., Asst. Professor of Bacteriology, Johns Hopkins School of Hygiene and Public Health

Eldon P. Morrell, P. O. Box 3348, Honolulu, T.H., Exec. Secy., Tuberculosis Assn. of the Territory of Hawaii

Dorothy Nadaner, 2217 Parker St., Berkeley 4, Calif., Bacteriologist, State Dept. of Public Health, Division of Laboratories

John H. Pearson, 98 N. Belvedere, Memphis, Tenn., State Representative, National Foundation for Infantile Paralysis, Inc.

Arthur Robinson, 90 W. Broad St., Columbus 15, Ohio, Exec. Secy., Community Health Services, Inc.

Dourest James Robinson, 536 Cypress, Daytona Beach, Fla., High School Teacher of Health Education  
 Carolyn E. Rohr, 606 Lyons Ave., Charlottesville, Va., Teacher of Physical and Health Education, High and Elementary Schools  
 William J. Root, R.N., 85 Commack Rd., Islip, N. Y., Student, New York University  
 Dora Slater, R.N., B.S. in Ed., 6306 Enright, St. Louis 5, Mo., Consultant, Nursing Services, St. Louis Chapter American Red Cross  
 Carl A. Trezise, 4014 Lorcom Lane, Arlington, Va., Research Investigator, Venereal Disease Division, U. S. Public Health Service  
 Georgine E. Upshur, M.S., 809 Riverside Drive, c/o Dench, New York, N. Y., Tuberculosis Worker, Harlem Tuberculosis and Health Committee  
 Segundo Vicente, M.D., Final Av. Los Manolos, Qta Charra, Caracas, Venezuela, S. A., Director of Public Health Education, Oficina Cooperativa Interamericana de Salud Publica of Venezuela  
 Kathryn K. Walter, P. O. Box 3348, Honolulu, T.H., Asst. Exec. Secy., Tuberculosis Assn. of the Territory of Hawaii

#### *Public Health Nursing Section*

Isabel Brechbiel, 625½ S. Wright St., Champaign, Ill., Public Health Nurse, State Dept. of Public Health  
 Lillian M. Derflinger, R.N., 4506 Casco Ave., Minneapolis, Minn., Student, University of Minnesota  
 Florence M. DeWitt, 5260 12th Ave., N.E., Seattle, Wash., Public Health Nurse, Seattle Visiting Nurse Service  
 K. Barbara Dormin, R.N., B.S., 695 Huntington Ave., Diabetes Unit. U.S.P.H.S., Boston, Mass., Public Health Nursing Consultant  
 Martha Jeanne Eagen, Main St., Stratford, Conn., Supervisor, Stratford Public Health Nursing Assn.  
 Ann Luise Finch, 808 N. Spring St., Los Angeles 12, Calif., Director, Bureau of Public Health Nursing, Los Angeles County Health Dept.  
 Marguerite M. Furey, 2525 Morris Ave., New York 58, N. Y., Nursing Consultant, National Society for the Prevention of Blindness  
 Elizabeth Hirst, 144 Gloucester St., Annapolis, Md., Field Supervisor, State Dept. of Health, Anne Arundel County Health Dept.  
 M. Christine Livingston, 1246 Bishop St., Montreal 25, Que., Canada, District Supt., Victorian Order of Nurses, Greater Montreal Branch  
 Gertrude L. McLaughlin, R.N., 1906 River-

side Drive, Trenton, N. J., Advisory Public Health Nurse, State Dept. of Health  
 Cecilia Pellicier de Sepulveda, Georgetown St. No. 52, Vega Alta, Puerto Rico, Public Health Nurse, Dept. of Health  
 Alma Rollins, 3300 Harris Park Ave., Austin, Tex., Asst. Director, Public Health Nursing Division, State Dept. of Health  
 Carol Roman, M.N., Box 846, Fortuna, Calif., Staff Nurse, Humboldt County Dept. of Public Health  
 Beatrice J. Stoegerer, M.S., 416 33rd St., S.E., Washington, D. C., Consultant Nurse, Institute of Interamerican Affairs  
 Alice M. Sundberg, R.N., Cambridge Arms Apts., Baltimore 18, Md., Asst. Director, Bureau of Public Health Nursing, City Health Dept.  
 Naomi B. Talbitzer, R.N., Box 960, Anchorage, Alaska, Staff Nurse, Territorial Dept. of Health  
 Elva C. Tromater, R.N., 805 Lemon Ave., Eustis, Fla., Nurse, Nutrition Investigations and Services, State Board of Health  
 Martha C. Willis, R.N., 128 W. 113th St., Chicago 28, Ill., Staff Nurse, Cook County Dept. of Public Health

#### *Epidemiology Section*

Seymour M. Gluck, 55 Hanson Place, Y.M.C.A., Brooklyn, N. Y., Medical Student, Long Island College of Medicine  
 William F. Lamb, M.D., M.P.H., 240 E. Madison, Louisville, Ky., Director, City Health Dept.  
 Kathryn J. McMorrow, M.D., M.P.H., 3919 John R., Detroit 1, Mich., Assoc. Physician, Detroit Dept. of Health  
 George R. Ridgway, Pineville Hospital, Box 152, Pineville, La., Health Representative, U. S. Public Health Service  
 Mark Sumner, P. O. Box 1249, Asheville, N. C., State Representative, National Foundation for Infantile Paralysis, Inc.  
 Conrad Wesselhoeft, M.D., 315 Marlborough St., Boston 16, Mass., Clinical Professor of Infectious Diseases, Harvard School of Public Health

#### *School Health Section*

Janet A. Caldwell, M.D., 3929 Potomac, Dallas 5, Tex., School Physician  
 John A. Fitz, M.A., 617 N. Oleander, Fontana, Calif., District Supt. of Schools, Fontana School District  
 Kenneth Goodman, M.D., 141 Park Ave., East Orange, N. J., Physician  
 Mary L. Somers, R.N., Health Dept., Box 120, Bakersfield, Calif., Supervisor, Public Health Nursing, Kern County Dept. of Public Health

*Dental Health Section*

- Paul Cook, D.D.S., M.P.H., 1220 Henry Clay Ave., New Orleans, La., Chief, Section of Dental Health, State Dept. of Health  
 Clarence A. Sinkler, D.D.S., 207 Minahan Bldg., Green Bay, Wis., City Dentist, Public Welfare Dept.  
 Glenna G. Walter, 222 E. Superior St., Chicago 11, Ill., Health Education Consultant, American Dental Assn.

*Unaffiliated*

- Albert L. Anderson, M.D., 44 Southgate Ave., Annapolis, Md., Director, Venereal Disease Clinic, Anne Arundel County  
 Lawrence J. Bonn, D.V.M., 6320 Broadway, Chicago 40, Ill., General Practitioner, Broadway Animal Hospital  
 Ada Blumer, R.N., State Sanatorium, Md., Medical Social Work Consultant, State Health Dept.  
 Frida Brackebusch, M.A., 613 Locust St., St. Louis 1, Mo., Exec. Secy. of Health and Hospital Division, Social Planning Council  
 Anne M. Charles, 3045 North 52nd, Lincoln, Neb., Student, Univ. of California  
 Archibald W. Dalton, 1790 Broadway, New York 19, N. Y., Assoc., Program Development, National Tuberculosis Assn.  
 Paul F. Ellis, United Press Assn., 220 E. 42nd St., New York, N. Y., Science Writer  
 Melvin E. Griffith, Ph.D., Univ. of Oklahoma, Dept. of Zoological Sciences, Norman, Okla., State Entomologist, Malaria Control Division, State Dept. of Health  
 Helen Jacobs, 608 E. 12th Ave., Denver 3, Colo., Personnel Officer, State Dept. of Public Health  
 Edith E. Johnson, 401 City Hall, Minneapolis, Minn., Administrative Asst., Minneapolis Health Dept.  
 York A. King, Jr., 156 N. 22nd St., Phila-

delphia 3, Pa., Manager, Rose Exterminator Co.

- David R. Lit, 855 Alvarado St., San Francisco 14, Calif., Administrative Methods Consultant, U. C. Children's Bureau  
 Walter S. Page, Jr., M.A., Box 1740, Paterson 17, N. J., Exec. Secy., Passaic County Tuberculosis and Health Assn.  
 Andrew Pattullo, 250 Champion, Battle Creek, Mich., Assoc. Hospital Director, W. K. Kellogg Foundation  
 Rose K. Starr, 111 N. 49th St., Philadelphia 39, Pa., Student, Univ. of Pennsylvania  
 Henry Swan, M.D., 4200 E. 9th Ave., Denver, Colo., Vice-President, Denver Public Health Council  
 Geneva Wiser, M.A., Anne Arundel County Health Dept., Annapolis, Md., Medical-Social Consultant, Annapolis, Md.  
 James Zeck, M.A., 128 W. Commerce St., 620 Health Bldg., San Antonio 5, Tex., Exec. Director, City-County Tuberculosis Control Board

## DECEASED MEMBERS

- Andrew H. Dibble, M.D., Louisville, Ky., Elected Member 1946, Health Officers Section  
 Judson D. Dowling, M.D., Menton, Ala., Elected Member 1930, Elected Fellow 1936, Health Officers Section  
 Mary C. Fulton, R.N., Evanston, Ill., Elected Member 1941, Public Health Nursing Section  
 Mrs. Mary C. Robinson, Yuma, Ariz., Elected Member 1938, Public Health Nursing Section  
 James E. Wolfe, M.D., Wichita, Kans., Elected Member 1942, Health Officers Section

## EMPLOYMENT SERVICE

The following pages present information for those seeking qualified public health personnel and for those seeking positions in public health.

This is a service of the Association conducted without expense to the employer or employee.

Address all correspondence to the Employment Service, A.P.H.A., 1790 Broadway, New York 19, N. Y., unless otherwise specified.

### POSITIONS AVAILABLE

(Supplemental to list in October Journal)

**Health Officer**, well qualified for McLean County Health Department, Illinois. Population 73,930 including city of Bloomington (32,900), which is the county seat and health department headquarters. Health department was established in 1945 and at present has a staff of 17 with all positions filled. Starting Salary \$7,200-\$8,100, depending upon training and experience. Write to R. P. Peairs, M.D., President, County Board of Health, 123 North Street, Normal, Ill.

**Sanitary Engineer** with sanitary engineering degree and two years' experience in environmental sanitation, or **Assistant Sanitary Engineer** requiring degree but no experience. Write to Civil Service Board, 412 City Hall, Dallas, Tex.

**Bacteriologist** to be in charge of city public health laboratory. Man preferred. Salary depends upon experience. Apply to Civil Service Board, 412 City Hall, Dallas, Tex.

**Pediatrician** with special experience in heart disease by the Territorial Department of Health. Beginning salary \$600 per month. Write C. Earl Albrecht, M.D., Commissioner of Health, Juneau, Alaska.

Well qualified **Bacteriologist and Serologist** to act as Assistant to Director of State Laboratory; Four years' experience in bacteriology including one year's experience in administrative capacity; college graduate, supplemented by graduate work in science leading to a master's degree in bacteriology or public health; salary \$3,840 to \$4,800; Civil Service status; retirement; permanent. Apply to: Mr. A. T. Johnson, Personnel Officer, Oregon State Board of Health, 1022 S. W. 11th Avenue, Portland 5, Ore.

**Six Health Officers** at once. Preferably under 45. Will employ two young medical doctors without public health training or experience at salary of \$6,000 plus mileage at 7½¢. Will place on payroll and give some orientation before assigning to counties as local health officers. Also, two Physicians with some public health

training and experience at beginning salary of \$6,300 or \$6,600 for well organized health units. Also, need two well trained and experienced men for larger health units at salaries from \$6,600 to \$8,400. Applicants must be eligible for licensure by Florida Medical Board. Headquarters of these health units are at Lake City, Monticello, Quincy, Bartow, West Palm Beach, and St. Petersburg, Fla. Write or wire Wilson T. Sowder, M.D., State Health Officer, Florida State Board of Health, P. O. Box 210, Jacksonville, Fla.

**Sanitarian** for modern food handling and restaurant sanitation program. Beginning salary \$3,120, annual increments. Car furnished. Position provides for vacation, sick leave, retirement benefits, permanency. For further particulars write Charles A. Neafie, M.D., Director, Department of Public Health, Pontiac 15, Mich.

**Veterinarian** for modern (quality) milk control program. Beginning salary \$3,120, annual increments. Car furnished. Position provides for vacation, sick leave, retirement benefits, permanency. For further particulars write Charles A. Neafie, M.D., Director, Department of Public Health, Pontiac 15, Mich.

1. **Public Health Nurse**, either with public health training or sufficient experience, for Taylor County, Florida. Salary range is prescribed by the Merit System from \$175 to \$250, depending upon training and experience. Must own car; mileage of 7½¢ per mile allowed. State retirement, state compensation, annual sick leave and annual vacation.

2. **Supervising Nurse** for Taylor and Madison Counties. Salary range from \$200 to \$275 per month. Communicate with Robert F. Sayre, M.D., Director, Madison County Health Department, P. O. Box 187, Madison, Fla.

**Public Health Nurses** for generalized program. Salary range \$1,680 to \$2,820 a year, based on qualifications. Under Merit System, retirement system, vacation and sick leave. Mileage paid at 6¢



*Dental Health Section*

- Paul Cook, D.D.S., M.P.H., 1220 Henry Clay Ave., New Orleans, La., Chief, Section of Dental Health, State Dept. of Health  
 Clarence A. Sinkler, D.D.S., 207 Minahan Bldg., Green Bay, Wis., City Dentist, Public Welfare Dept.  
 Glenna G. Walter, 222 E. Superior St., Chicago 11, Ill., Health Education Consultant, American Dental Assn.

*Unaffiliated*

- Albert L. Anderson, M.D., 44 Southgate Ave., Annapolis, Md., Director, Venereal Disease Clinic, Anne Arundel County  
 Lawrence J. Bonn, D.V.M., 6320 Broadway, Chicago 40, Ill., General Practitioner, Broadway Animal Hospital  
 Ada Blumer, R.N., State Sanatorium, Md., Medical Social Work Consultant, State Health Dept.  
 Frieda Brackebusch, M.A., 613 Locust St., St. Louis 1, Mo., Exec. Secy. of Health and Hospital Division, Social Planning Council  
 Anne M. Charles, 3045 North 52nd, Lincoln, Neb., Student, Univ. of California  
 Archibald W. Dalton, 1790 Broadway, New York 19, N. Y., Assoc., Program Development, National Tuberculosis Assn.  
 Paul F. Ellis, United Press Assn., 220 E. 42nd St., New York, N. Y., Science Writer  
 Melvin E. Griffith, Ph.D., Univ. of Oklahoma, Dept. of Zoological Sciences, Norman, Okla., State Entomologist, Malaria Control Division, State Dept. of Health  
 Helen Jacobs, 608 E. 12th Ave., Denver 3, Colo., Personnel Officer, State Dept. of Public Health  
 Edith E. Johnson, 401 City Hall, Minneapolis, Minn., Administrative Asst., Minneapolis Health Dept.  
 York A. King, Jr., 156 N. 22nd St., Philadelphia 3, Pa., Manager, Rose Exterminator Co.  
 David R. Lit, 855 Alvarado St., San Francisco 14, Calif., Administrative Methods Consultant, U. C. Children's Bureau  
 Walter S. Page, Jr., M.A., Box 1740, Paterson 17, N. J., Exec. Secy., Passaic County Tuberculosis and Health Assn.  
 Andrew Pattullo, 250 Champion, Battle Creek, Mich., Assoc. Hospital Director, W. K. Kellogg Foundation  
 Rose K. Starr, 111 N. 49th St., Philadelphia 39, Pa., Student, Univ. of Pennsylvania  
 Henry Swan, M.D., 4200 E. 9th Ave., Denver, Colo., Vice-President, Denver Public Health Council  
 Geneva Wiser, M.A., Anne Arundel County Health Dept., Annapolis, Md., Medical-Social Consultant, Annapolis, Md.  
 James Zeck, M.A., 128 W. Commerce St., 620 Health Bldg., San Antonio 5, Tex., Exec. Director, City-County Tuberculosis Control Board

## DECEASED MEMBERS

- Andrew H. Dibble, M.D., Louisville, Ky., Elected Member 1946, Health Officers Section  
 Judson D. Dowling, M.D., Menton, Ala., Elected Member 1930, Elected Fellow 1936, Health Officers Section  
 Mary C. Fulton, R.N., Evanston, Ill., Elected Member 1941, Public Health Nursing Section  
 Mrs. Mary C. Robinson, Yuma, Ariz., Elected Member 1938, Public Health Nursing Section  
 James E. Wolfe, M.D., Wichita, Kans., Elected Member 1942, Health Officers Section

## EMPLOYMENT SERVICE

The following pages present information for those seeking qualified public health personnel and for those seeking positions in public health.

This is a service of the Association conducted without expense to the employer or employee.

Address all correspondence to the Employment Service, A.P.H.A., 1790 Broadway, New York 19, N. Y., unless otherwise specified.

### POSITIONS AVAILABLE

(Supplemental to list in October Journal)

**Health Officer**, well qualified for McLean County Health Department, Illinois. Population 73,930 including city of Bloomington (32,900), which is the county seat and health department headquarters. Health department was established in 1945 and at present has a staff of 17 with all positions filled. Starting Salary \$7,200-\$8,100, depending upon training and experience. Write to R. P. Peairs, M.D., President, County Board of Health, 123 North Street, Normal, Ill.

**Sanitary Engineer** with sanitary engineering degree and two years' experience in environmental sanitation, or **Assistant Sanitary Engineer** requiring degree but no experience. Write to Civil Service Board, 412 City Hall, Dallas, Tex.

**Bacteriologist** to be in charge of city public health laboratory. Man preferred. Salary depends upon experience. Apply to Civil Service Board, 412 City Hall, Dallas, Tex.

**Pediatrician** with special experience in heart disease by the Territorial Department of Health. Beginning salary \$600 per month. Write C. Earl Albrecht, M.D., Commissioner of Health, Juneau, Alaska.

Well qualified **Bacteriologist and Serologist** to act as Assistant to Director of State Laboratory; Four years' experience in bacteriology including one year's experience in administrative capacity; college graduate, supplemented by graduate work in science leading to a master's degree in bacteriology or public health; salary \$3,840 to \$4,800; Civil Service status; retirement; permanent. Apply to: Mr. A. T. Johnson, Personnel Officer, Oregon State Board of Health, 1022 S. W. 11th Avenue, Portland 5, Ore.

**Six Health Officers** at once. Preferably under 45. Will employ two young medical doctors without public health training or experience at salary of \$6,000 plus mileage at 7½¢. Will place on payroll and give some orientation before assigning to counties as local health officers. Also, two Physicians with some public health

training and experience at beginning salary of \$6,300 or \$6,600 for well organized health units. Also, need two well trained and experienced men for larger health units at salaries from \$6,600 to \$8,400. Applicants must be eligible for licensure by Florida Medical Board. Headquarters of these health units are at Lake City, Monticello, Quincy, Bartow, West Palm Beach, and St. Petersburg, Fla. Write or wire Wilson T. Sowder, M.D., State Health Officer, Florida State Board of Health, P. O. Box 210, Jacksonville, Fla.

**Sanitarian** for modern food handling and restaurant sanitation program. Beginning salary \$3,120, annual increments. Car furnished. Position provides for vacation, sick leave, retirement benefits, permanency. For further particulars write Charles A. Neafie, M.D., Director, Department of Public Health, Pontiac 15, Mich.

**Veterinarian** for modern (quality) milk control program. Beginning salary \$3,120, annual increments. Car furnished. Position provides for vacation, sick leave, retirement benefits, permanency. For further particulars write Charles A. Neafie, M.D., Director, Department of Public Health, Pontiac 15, Mich.

1. **Public Health Nurse**, either with public health training or sufficient experience, for Taylor County, Florida. Salary range is prescribed by the Merit System from \$175 to \$250, depending upon training and experience. Must own car; mileage of 7½¢ per mile allowed. State retirement, state compensation, annual sick leave and annual vacation.

2. **Supervising Nurse** for Taylor and Madison Counties. Salary range from \$200 to \$275 per month. Communicate with Robert F. Sayre, M.D., Director, Madison County Health Department, P. O. Box 187, Madison, Fla.

**Public Health Nurses** for generalized program. Salary range \$1,680 to \$2,820 a year, based on qualifications. Under Merit System, retirement system, vacation and sick leave. Mileage paid at 6¢

per mile. Apply to Dr. Fred G. Pegg, Health Officer, City-County Health Department, Winston-Salem, N. C.

**Public Health Laboratory Technician** for County Health Department. Must have valid state Public Health Laboratory Technician's certificate, or be eligible to apply for same. Salary is \$240 a month. Position is permanent and carries County civil service status. Write Civil Service and Personnel Office, Courthouse, San Bernardino, Calif.

**Veterinarian.** Licensed in Ohio or eligible for reciprocity, to assume, Chief, Division of Dairy & Foods. Meat and fowl inspection, slaughter house sanitation; three lay assistants. Active County-City Department of Health. Prefer candidate having public health experience to assist in coordination of general health education program. Salary open pending qualifications. Write Box 0-3. Employment Service. American Public Health Association.

**Executive Secretary** for Industrial Health Education Program in midwestern metropolitan city. Duties are to promote to industry and organized labor groups a coordinated health education program, on behalf of the official and voluntary agencies in the community and to edit monthly health education bulletin to workers. Project under direction of a management body composed of representatives of industry, organized labor, and the health agencies. Graduation from an accredited college or university, including training and experience in health education, community organization, promotion and editorial skill essential. Salary \$4,000-\$5,000. Write Box M-2 Employment Service A.P.H.A.

**Associate Bacteriologists:** Applicant must have a college degree and one year of training in a State Public Health Laboratory or a School of Public Health and Hygiene. Salary: \$2,832-\$3,638. Apply State Department of Health, Box 1877, Richmond, Va.

**Assistant Bacteriologist** for City of Kalamazoo, Mich. To perform bacteriological and serological examinations. College degree with emphasis on science and one year pertinent experience or equivalent combination of training and experience required. Write. Personnel Office, 241 W. South Street, Kalamazoo 9, Mich. Application will be received until further notice.

**Sanitary Inspector** for City of Manitowoc, Wis. Requirements: Age 25-40, male, high school graduate, must own car. Desired qualifications: College grad-

uate, health department experience, training in milk and dairy manufacture or bacteriology. Salary \$2,400 plus car allowance. Applications must be submitted before November 15. Write City Clerk, Manitowoc, Wis.

**Registered Graduate Nurses:** as ward supervisors. Beginning salary \$180. Live in or out. Forty-eight-hour week. Uniforms and laundering of them if desired. Write immediately: Tennessee Department of Public Health, Division Tuberculosis Control, Nashville, Tenn.

**Supervising Public Health Nurse** and **Public Health Staff Nurse** in Alger-Schoolcraft Health Department in the Upper Peninsula of Michigan. Supervising nurse salary \$2,700 plus travel expenses. Staff nurse salary \$2,400 plus travel. Liberal vacation and sick leave allowed. Write to Dr. W. J. Broad, Director, Alger-Schoolcraft Health Department, Manistique, Mich.

Several qualified **Public Health Officers** in Texas. Salary range \$5,500 to \$7,200 per year plus travel allowance. Apply to George W. Cox, M.D., State Health Officer, Austin, Tex.

Applications for position of **Director of the Weld County Health Department**, Greeley, Colo. Require graduation from Class A Medical School with training or experience in public health. Present salary is \$500 per month plus travel expense. Please send qualifications in first letter and apply to R. L. Cleere, M.D., Executive Director, State Board of Health, State Office Building, Denver 2, Colo.

Well trained **Bacteriologist** capable of supervising bacteriologists working in state mental institution laboratories, \$305-\$365 monthly; also bacteriologists to be trained in state health department laboratory for positions in state mental institution laboratories, \$190-\$245 monthly. Write Box L-539, Employment Service, A.P.H.A.

**Bacteriologist**, male, minimum three years' experience in Public Health Laboratory; college graduate with major in bacteriology, preferably supplemented by courses in science leading to a Master's degree; \$270 to begin, advancing to \$340; Civil Service status; Retirement. Apply to: A. T. Johnson, Personnel Officer, Oregon State Board of Health, 1022 S.W. 11th Ave., Portland 5, Ore.

**Laboratory Technician**, male or female; college graduate with major in bacteriology, plus minimum of two years' experience in Laboratory; \$200 to begin, advancing to \$260; Permanent, Civil Service

status; Retirement. Apply to: A. T. Johnson, Personnel Officer, Oregon State Board of Health, 1022 S.W. 11th Ave., Portland 5, Ore.

**Supervisory Nurse, Nursing Education Director, and Staff Nurse positions available:** City-County Health Department, generalized nursing program. Nursing Education Director, \$2,940-\$3,240, degree in public health nursing required. Supervisor, \$2,520-\$2,940, degree preferred. Sr. Staff Nurse, \$2,220-\$2,400, a certificate or its equivalent. Maximum salary reached in three year period. Forty-hour week, retirement plan, mileage. Write Dr. Geo. A. Denison, Box 2591, Birmingham, Ala.

**Supervising nurse for City-County Department of Health.** Thriving progressive industrial and agricultural community of 74,000. Staff of nine nurses with promise of more in 1948. New and interesting developments, such as cancer diagnostic clinic, expanding school health program, additional child welfare clinics. Special Venereal Disease and Tuberculosis Clinics. Salary \$3,192 plus \$600 travel. Address Fred O. Tonney, M.D., Commissioner of Health, Municipal Building, Mansfield, Ohio.

**Hawaii Board of Health Wants: One Public Health Statistician** to direct the Bureau of health (vital statistics). (Salary: \$407.08 to \$481.67 plus \$25.00 monthly bonus.) Qualifications: Five years of responsible statistical experience, of which three years shall have been of a research and supervisory character in the field of public health, and graduation from a university of recognized standing with courses in advanced statistics, supplemented by one year of graduate work in public health with specialization in public health statistics. Write air mail to: President: Board of Health, P. O. Box 3378, Honolulu 1, Hawaii.

**Qualified personnel to serve with Eighth Army in Japan and Korea.** Civilian Status. One to 2 years minimum tour of duty. Periodic vacancies for: (1) Physicians as public health officers and welfare officers. (2) Public health nurses.

(3) Sanitary Engineers. (4) Laboratory Workers. For information write to: Personnel and Training Branch, Civil Affairs Division, War Department Special Staff, Washington 25, D. C.

**Staff Public Health Nurse** for generalized program at the Mamaroneck Health Center, Inc. Salary \$2,580 per year. Thirty-eight hour work week—car furnished. Apply to Mrs. Genevieve Heatley, President, Mamaroneck Health Center, Inc., 234 Stanley Avenue, Mamaroneck, N. Y.

**Dental Hygienists for Child Health Programs.** Beginning Salaries \$2,168.28-\$2,394. Write to: U. S. Public Health Service, Dental Public Health Section, Washington 11, D. C.

**Tuberculosis Clinician.** Duties include organizing and supervising tuberculosis diagnostic clinics throughout the state, organizing community and industrial x-ray surveys, interpreting x-ray films, and assisting with other related tuberculosis control activities. Must be eligible for West Virginia license. Salary range, \$420 to \$500 monthly, plus travel. Address inquiries to West Virginia State Dept. of Health, Charleston, W. Va.

**Supervisor of Health Education Department** needed in Chicago and Cook County Tuberculosis Institute, man preferred. Candidates must have public health background and experience in community education programs. Salary open. Excellent opportunity for developing broad education in tuberculosis control programs. For further information write Dr. E. E. Kleinschmidt, Tuberculosis Institute of Chicago and Cook County, 343 South Dearborn Street, Chicago 4, Ill.

GOVERNMENT OF THE DISTRICT OF COLUMBIA,  
WASHINGTON, D. C.

**Graduate nurses for staff duty** in Glenn Dale Tuberculosis Sanatorium located 15 miles from the Nation's Capitol. Salary \$2,644.80 per annum. Apply Director of Nursing, Glenn Dale Sanatorium, Glenn Dale, Md.

## POSITIONS WANTED

**Non-medical administrator, male, age 33,** trained and experienced in community organization, program development, rehabilitation, publicity, public relations; at present employed in large state welfare planning and action organization. Inter-

ested in position as executive secretary or in related function in voluntary or official health agency. Write Box A-529. Employment Service. A.P.H.A.

**Chemist, Virologist, B.A.,** experience

*Advertisement***Opportunities Available**

WANTED—(a) Public health nurse of supervisory caliber with knowledge of Spanish to supervise modern health center in Latin America; duties include teaching. (b) Supervisor of nurses; student health department, state university; duties involve preventive treatment and instruction in hygiene; \$2,900 including partial maintenance; month's vacation annually. (c) Director, newly created visiting nurse service supported by Community Chest and allied organizations; town of 60,000; \$3,600. (d) School nurse; public health training or experience desirable; town of 70,000 short distance from Chicago; \$3,100, ten month year. (e) Supervising nurse; county health department, Southern California. **PH11-1** Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago 11.

WANTED—(a) Young woman with either Ph.D. or medical degree for important faculty appointment; university having highly organized program of professional training in health field; rank dependent upon experience; West. (b) Ph.D. in public health; faculty appointment, western university; duties include teaching public health courses, supervision of campus sanitation. (c) Health educator trained in school of public health; state association; East. **PH11-2** Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago 11.

WANTED—(a) Physician with administrative ability to direct program of national organization; admin-

istrative or public health experience advantageous; should be capable public speaker; \$10,000. (b) Young physician with public health background for assistant medical directorship, large teaching hospital; eastern metropolis. (c) Medical officer; public health experience, preferably with rural health program; key position requiring administrative ability; \$7,200; Latin America. (d) Medical director; department of health, city of 100,000; duties include directing control of communicable diseases, venereal disease clinic, school health. (e) Physician experienced in student health or public health work for newly created position of assistant medical director, student health department, one of the country's largest universities; preferably one qualified to succeed director upon his retirement within three years; \$7,000. **PH11-3** Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago 11.

WANTED—(a) Assistant professor of sanitary engineering; nine month year; \$4,000; opportunity for teaching two months during summer which would increase income \$1,000. (b) Industrial hygiene chemist; large mining company; West. (c) Sanitary engineer thoroughly experienced in public health work; should be familiar with drainage problems, insect control, water purification; administrative appointment; East Indies. (d) Sanitary engineer to direct Bureau of Mosquito Control; around \$6,000; U. S. dependency. **PH11-4** Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago 11.

*Advertisement***Opportunities Wanted**

Parasitologist; M.S. degree in Public Health; interested in research; fairly recent graduate; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Public Health Nurse is available for supervising position; B.S.; certificate, Public Health Nursing; since 1939, public health nursing, principally of administrative character; for further information please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Sanitary and public health engineer; B.S. degree (major chemical engineering); M.S. sanitary engineering and public health administration; several years with State Department of Sanitary Engineering; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Public health physician; A.B., M.D. degrees eastern school; M.P.H. Johns Hopkins; twelve years county health officer, directing generalized public health program; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Dentist who has been successful in private practice for twelve years is available for position with health agency; for five years served as member of state board of dental examiners; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Health Educator; Ph.D.; several years, instructor nutrition; seven years, director health education, state organization; past several years, associate professor hygiene, state university; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

in research on pathogenic viruses (Army Bacteriological Warfare Project), as well as in micro-spectrophotometric vitamin analyses in nutrition survey. Male, single, will travel. Write Box L-543. Employment Service. A.P.H.A.

**Negro Woman Health Education Worker.** Capable of executing an extensive health education program. B.A. degree. 12 years' experience as social worker. 3 years as Health Education Secretary for County Association. Special training in field of Tuberculosis control. Write Box H-542. Employment Service. A.P.H.A.

**Woman Biologist, M.A., D.Sc.,** several years' experience in morphology, experimental pathology, interested either academic position or industrial research. Write Box L-541. Employment Service. A.P.H.A.

**Health Educator, female,** experienced in promotion and organization of community activities. Prepared to handle complete details of new program to formulate policies, train personnel, act as liaison between community agencies. B.S. degree in Health Education. Present employment with voluntary health agency. Minimum salary \$4,000. Write Box H-540. Employment Service. A.P.H.A.

**Sanitarian with more than six years' experience** in various phases of environmental sanitation inclusive food, water, and insect control desires position. Holds Canadian Public Health Association cer-

tificate as Sanitary Inspector. Write Box E-522. Employment Service. A.P.H.A.

**Sanitary Engineer B.S.** 12 years' experience in public health engineering with State and Federal Agencies and Army. Some graduate work; currently on terminal leave; desires position in official agency or private industry; free to travel. Write Box E-520. Employment Service. A.P.H.A.

**Milk and Food Specialist.** Young man with eight years of experience in milk and food sanitation and its allied fields, last five years with U. S. Public Health Service, Master's degree. Desires position as director of division or comparable industrial position. Write Box M-438. Employment Service. A.P.H.A.

**Veterinarian** interested in any phase of Public Health Work, governmental or voluntary. Willing to undergo period of training. Training includes D.V.M. and B.S. degrees, with electives in chemistry, bacteriology, sanitation, animal micrology. Experience: University histology, laboratory, city health department diagnostic laboratory, senior consultant veterinarian, UNRRA. Write Box V-306, Employment Service, A.P.H.A.

**Licensed Veterinarian:** Public health and disease control experience in U. S. and abroad desires position in public health or industry. Write Box V-308, Employment Service, A.P.H.A.

### Apprentice Training Program for Public Health Nutritionist in New York State

The New York State Health Department announces a new program for the training of public health nutritionists. The objective is "to offer experience under close supervision in the public health field to nutritionists with good academic training but inadequate field experience."

A.B.S. degree from a recognized institution with sound training in human nutrition and one year of graduate work leading to a master's degree represents the basic academic requirement. In addition, it is desirable that workers in public health nutrition have special courses in public health education, community organization and resources, child development, and the making of dietary studies.

It is planned to offer a 12 month period of supervised field service on an annual stipend of \$2,500 plus travel allowance. Car desirable but not essential. Write to Senior Nutritionist, Division of Maternal and Child Health, New York State Department of Health, 39 Columbia Street, Albany 7, N. Y.

in research on pathogenic viruses (Army Bacteriological Warfare Project), as well as in micro-spectrophotometric vitamin analyses in nutrition survey. Male, single, will travel. Write Box L-543. Employment Service. A.P.H.A.

**Negro Woman Health Education Worker.** Capable of executing an extensive health education program. B.A. degree. 12 years' experience as social worker. 3 years as Health Education Secretary for County Association. Special training in field of Tuberculosis control. Write Box H-542. Employment Service. A.P.H.A.

**Woman Biologist, M.A., D.Sc.,** several years' experience in morphology, experimental pathology, interested either academic position or industrial research. Write Box L-541. Employment Service. A.P.H.A.

**Health Educator, female,** experienced in promotion and organization of community activities. Prepared to handle complete details of new program to formulate policies, train personnel, act as liaison between community agencies. B.S. degree in Health Education. Present employment with voluntary health agency. Minimum salary \$4,000. Write Box H-540. Employment Service. A.P.H.A.

**Sanitarian** with more than six years' experience in various phases of environmental sanitation inclusive food, water, and insect control desires position. Holds Canadian Public Health Association cer-

tificate as Sanitary Inspector. Write Box E-522. Employment Service. A.P.H.A.

**Sanitary Engineer B.S.** 12 years' experience in public health engineering with State and Federal Agencies and Army. Some graduate work; currently on terminal leave; desires position in official agency or private industry; free to travel. Write Box E-520. Employment Service. A.P.H.A.

**Milk and Food Specialist.** Young man with eight years of experience in milk and food sanitation and its allied fields, last five years with U. S. Public Health Service, Master's degree. Desires position as director of division or comparable industrial position. Write Box M-438. Employment Service. A.P.H.A.

**Veterinarian** interested in any phase of Public Health Work, governmental or voluntary. Willing to undergo period of training. Training includes D.V.M. and B.S. degrees, with electives in chemistry, bacteriology, sanitation, animal micrology. Experience: University histology, laboratory, city health department diagnostic laboratory, senior consultant veterinarian, UNRRA. Write Box V-306, Employment Service, A.P.H.A.

**Licensed Veterinarian:** Public health and disease control experience in U. S. and abroad desires position in public health or industry. Write Box V-308, Employment Service, A.P.H.A.

### Apprentice Training Program for Public Health Nutritionist in New York State

The New York State Health Department announces a new program for the training of public health nutritionists. The objective is "to offer experience under close supervision in the public health field to nutritionists with good academic training but inadequate field experience."

A.B.S. degree from a recognized institution with sound training in human nutrition and one year of graduate work leading to a master's degree represents the basic academic requirement. In addition, it is desirable that workers in public health nutrition have special courses in public health education, community organization and resources, child development, and the making of dietary studies.

It is planned to offer a 12 month period of supervised field service on an annual stipend of \$2,500 plus travel allowance. Car desirable but not essential. Write to Senior Nutritionist, Division of Maternal and Child Health, New York State Department of Health, 39 Columbia Street, Albany 7, N. Y.

## Advertisement

# Opportunities Available

**WANTED**—(a) Public health nurse of supervisory caliber with knowledge of Spanish to supervise modern health center in Latin America; duties include teaching. (b) Supervisor of nurses; student health department, state university; duties involve preventive treatment and instruction in hygiene; \$2,900 including partial maintenance; month's vacation annually. (c) Director, newly created visiting nurse service supported by Community Chest and allied organizations; town of 60,000; \$3,600. (d) School nurse; public health training or experience desirable; town of 70,000 short distance from Chicago; \$3,100, ten month year. (e) Supervising nurse; county health department, Southern California. **PH11-1** Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago 11.

**WANTED**—(a) Young woman with either Ph.D. or medical degree for important faculty appointment; university having highly organized program of professional training in health field; rank dependent upon experience; West. (b) Ph.D. in public health; faculty appointment, western university; duties include teaching public health courses, supervision of campus sanitation. (c) Health educator trained in school of public health; state association; East. **PH11-2** Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago 11.

**WANTED**—(a) Physician with administrative ability to direct program of national organization; admin-

istrative or public health experience advantageous; should be capable public speaker; \$10,000. (b) Young physician with public health background for assistant medical directorship, large teaching hospital; eastern metropolis. (c) Medical officer; public health experience, preferably with rural health program; key position requiring administrative ability; \$7,200; Latin America. (d) Medical director; department of health, city of 100,000; duties include directing control of communicable diseases, venereal disease clinic, school health. (e) Physician experienced in student health or public health work for newly created position of assistant medical director, student health department, one of the country's largest universities; preferably one qualified to succeed director upon his retirement within three years; \$7,000. **PH11-3** Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago 11.

**WANTED**—(a) Assistant professor of sanitary engineering; nine month year; \$4,000; opportunity for teaching two months during summer which would increase income \$1,000. (b) Industrial hygiene chemist; large mining company; West. (c) Sanitary engineer thoroughly experienced in public health work; should be familiar with drainage problems, insect control, water purification; administrative appointment; East Indies. (d) Sanitary engineer to direct Bureau of Mosquito Control; around \$6,000; U. S. dependency. **PH11-4** Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago 11.

## Advertisement

# Opportunities Wanted

Parasitologist; M.S. degree in Public Health; interested in research; fairly recent graduate; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Public Health Nurse is available for supervising position; B.S.; certificate, Public Health Nursing; since 1939, public health nursing, principally of administrative character; for further information please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Sanitary and public health engineer; B.S. degree (major chemical engineering); M.S. sanitary engineering and public health administration; several years with State Department of Sanitary Engineering; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Public health physician; A.B., M.D. degrees eastern school; M.P.H. Johns Hopkins; twelve years county health officer, directing generalized public health program; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Dentist who has been successful in private practice for twelve years is available for position with health agency; for five years served as member of state board of dental examiners; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Health Educator; Ph.D.; several years, instructor nutrition; seven years, director health education, state organization; past several years, associate professor hygiene, state university; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.



## NEWS FROM THE FIELD

### THE PRINCETON CONFERENCE ON LOCAL HEALTH UNITS

Representatives of 65 national citizens' organizations met at Princeton University, September 8-10, in a Conference on Local Health Units to discuss practical possibilities and methods of providing adequate public health services for every citizen in the United States. These agencies and their state and local branches represented not less than 50,000 points of public influence and education.

The conference, called by the A.P.H.A. Subcommittee on Local Health Units, provided the first opportunity for representatives of the general public to consider the problem of adequate coverage of the nation by local public health services. An earlier conference in Ann Arbor, Mich., in September, 1946, had been attended by the official administrative officers of the 48 state departments of health. Both meetings were made possible by grants from the W. K. Kellogg Foundation.

As a result of the Princeton conference, the citizen groups called upon the A.P.H.A. to provide immediate guidance and leadership in helping to define health problems and in providing an overall guide for operations of participating organized citizen groups in establishing and strengthening local health services.

The formation of state-wide citizen health groups was recommended to coordinate public participation in programs for community health services in each state. The group also endorsed the necessity for local health councils but stressed the need for professional participation in the planning and activities of these councils.

The opening address of the conference was given by Dr. Haven Emerson, Chairman of the A.P.H.A. Subcom-

mittee on Local Health Units, who declared, "Local government that fails to serve its people by providing basic health services is a failure in democracy."

Dr. Emerson added, "There can be no substance or reality in health organizations at the state, national, and international levels unless the base, the foundation structure, the essential functioning element in all public health service is developed, accepted, and supported at the local or community level."

"Without the framework and organization of local health departments directed and staffed by professionally qualified full-time employees, all private effort and private funds (expended for health purposes) will be largely wasted or will be applied usefully only in those areas where competent local health service is being already provided."

Repeating the findings of the A.P.H.A. survey published by the Commonwealth Fund in 1945 in *Local Health Units for the Nation*, Dr. Emerson told the delegates that 41,000,000 people in the United States are "living in communities which lack full-time, modern, local health departments for providing even the six basic health services considered indispensable . . . It appears that there are approximately 155,000 local government jurisdictions which may, if they wish, set up local health departments in the United States. There are, in fact, some 18,500 such local health departments. There are 3,070 counties in the 48 states. In the opinion of the Committee on Local Health Units of the A.P.H.A., not more than 1,200 local health departments are needed to cover the nation."

The basic structure and functions of a local health department were presented

to the delegates by Dr. Wilson G. Smillie, Professor of Preventive Medicine and Public Health at Cornell University Medical College. He pointed out that "a local health department is one which is organized to meet adequately the health needs of a governmental unit smaller than the state." Dr. Smillie's presentation was further elaborated in addresses by Dr. T. Paul Haney, Bureau of Maternal and Child Health, Florida State Board of Health, Dr. Mack I. Shanholtz, Division of Preventive Medicine, Oklahoma State Health Department, and by Mrs. O. L. Webb of the Nebraska Statewide Health Committee.

What a local health department is, according to these speakers who represented educators, lay citizens, and local public health administrators, may be summarized in the six items below. Grass roots responsibility arising out of local popular understanding was stressed by each speaker.

A local health department should do at least the following for its community:

1. Keep the facts of births, deaths, sickness, and make them available for use in planning community health programs, school services, industrial health services, and hospital and medical care facilities.
2. Carry out all necessary activities to control communicable and preventable diseases such as tuberculosis, venereal diseases, malaria, hookworm disease, and the communicable diseases of childhood.
3. Supervise the health of the mother and the child from birth through school years, finding the remediable defects of eyes, hearing, teeth, nutrition, and posture, and providing for their correction either directly or through existing community facilities.
4. Supervise the physical surroundings of the community and coördinate the necessary activities for making it favorable to health and well-being. This means providing for clean water, milk, and food, for healthful housing, working conditions, proper sewage disposal, and sanitary recreation facilities, and for safety in home, school, and shop.
5. Provide public health laboratory service both to carry out its own job and to assist

practising doctors of the community in diagnosis and treatment.

6. Carry on public health education, making known to the people generally the facts of modern biology and science, and giving instruction in the use of such facts to keep in good physical health.

Dr. Florence R. Sabin, Health Chairman of the Colorado Post-War Planning Committee, spoke on "How Citizens Make Their Wishes Known." Dr. Sabin outlined a recent campaign in which she was active in Colorado which resulted in replacing health laws passed in 1876 with modern legislation. Two conditions are necessary, she said, before reorganization of health services for the people's benefit could be achieved: (1) the people must know the facts about the health and sanitation conditions in their communities, and (2) demonstrations must be given of the exact contributions which preventive medicine can contribute to their lives.

Dr. Sabin added that in Colorado the success of the campaign was due to the activities of organized groups in local communities in informing the public and bringing pressure for legislative action. The people of Colorado were so well informed and so aroused about the public health situation in the state, that their legislative representatives had no choice but to pass the proposed laws and to authorize appropriations necessary to carry out their purposes.

The part that voluntary organizations can play in developing wider public knowledge and demand for modern local health services was presented by two representatives of such organizations, George J. Nelbach of the New York State Committee on Tuberculosis and Public Health, and James G. Stone of the National Tuberculosis Association. Mr. Stone quoted the 1947 platform of the National Tuberculosis Association: "Tuberculosis services to be most effective should be integrated with general community health facilities. To that

end, tuberculosis associations should work to secure the establishment of adequately staffed local health services." He urged the need for this plank in the platforms of other national health agencies.

The great lack of adequate health services in rural areas was emphasized by Dr. Fred Mayes, Director of the Division of Local Health Administration, Kansas State Health Department. The solution proposed was consolidation of several thinly populated counties into public health units, which, although expanded in area and assisted by state leadership, would still be locally operated community agencies. The minimum population that can well support a local health department is 50,000; a larger population when feasible.

Other speakers were Dr. Henry F. Vaughan, Dean, University of Michigan School of Public Health, who discussed "Financing and Staffing of a Local Health Department." He reminded his audience that "health is a purchasable commodity, as essential to man's well-being as food, fuel, shelter, and clothing."

Dr. Joseph McLean, Professor of Government, Princeton University, in a paper entitled "Local Government in Relation to Local Health Service," outlined the complexities of local, state, and federal relationships, both administrative and financial, that must be considered in organizing local activities, health service no less than others. Dr. McLean warned that the process of consolidating municipalities into county or district units in New Jersey and the New England states would be slow but must nevertheless be undertaken. He cited a 1937 study of local government in New Jersey which arrived at the conclusion that most of the official services of government—health, welfare, sewage disposal, fire and police protection, and many others—are best done in population units of at least 50,000.

Dr. G. F. Moench, Hillsdale, Mich., Health Chairman of the National Congress of Parents and Teachers, discussed the ways in which the national agency can get this message to its local branches. Among his suggestions were a clear-cut national program in which local branches can participate, and co-operation between national and local agencies in carrying out a unified community program.

Following the presentation of papers, morning and afternoon, the delegates separated into smaller groups for discussion. An enthusiastic purposeful approach to the problems posed was demonstrated by the four lively discussion periods. Discussion leaders were selected from the invited representatives of the citizen organizations.

The great stress on the necessity for an informed citizenry led to the suggestion that the minimum personnel standards promulgated by the A.P.H.A. be expanded to include a health educator on the staff of each local health unit of adequate size for economical and efficient operation.

The development of model plans by national associations for the promotion of active well informed committees through their state and local affiliations was recommended as a means of developing a strong public opinion in support of local health programs. In developing such model plans, the national citizen agencies proposed that the American Public Health Association develop facilities for furnishing guidance and help to the national agencies.

A word should be said about what one delegate called "the exalted feeling that pervaded the last quarter hour." Bailey B. Burritt, Director of the National Health Council, and Dr. Sabin each summed up some of the aspects of the conference. Said Mr. Burritt, "We have developed not only a new factual appreciation of the necessity for local health units but an awakening of our

emotional appreciation of this fact. However, unless this factual and emotional appreciation leads to action, this conference will not have achieved its main purpose."

Dr. Sabin summed up some of the slogans that had come out of the meeting, such as "We cannot get public health overnight but we should work as if we could," "Adult education is submerged leadership," "Preventive medicine is economically sound," "Public health is public wealth," and finally a quotation from Ralph Waldo Emerson, "What will you have? quoth God. Pay for it and take it."

Following are the resolutions passed by the conference:

*Resolution Presented at the National Conference on Local Health Units, by J. S. Jones, Secretary, The Minnesota Farm Bureau Federation:*

Public health is public wealth. The greatest actual and potential asset of the United States, of each state and each local unit of government is a vigorous, healthy citizenry. Recognizing the great advances that have been made in preventing unnecessary illness and the maintenance of health, it is still true that there is a wide gap between knowledge and practice in the protection of the health of the people.

This is a problem that concerns every person. It is at once an individual and collective responsibility. The realization of a high degree of health of the people of these United States cannot be achieved while forty-one million persons are residing in areas without the protection of a local health unit manned by a full-time, well trained public health official and sufficient staff to render skilled health services.

This situation has been reviewed thoughtfully by representatives from sixty-five na-

tional voluntary organizations in a conference at Princeton, N. J., under the auspices of the American Public Health Association. As a result of their deliberations they are of the unanimous opinion that this is an immediate challenge. The war emphasized the challenge, and now the necessity of organization for a stable future gives it renewed emphasis. The opportunity is great and its achievement practical.

As representatives of these 65 national citizens' organizations we are now prepared to urge upon each such organization the immediacy of this challenge and the great opportunity it offers, and to urge further that vigorous steps be taken by each agency through national, state, and local branches to include in their programs of work completion of health unit coverage of all areas so that at least minimum protection may be given to the maintenance of health of every person.

*Motion presented by Miss Ruth Bottomly, Executive Secretary, National Congress of Parents and Teachers:*

Moved that the members of the National Conference on Local Health Units request the American Public Health Association to make available in some published form the complete proceedings of the Conference, sending one copy to each agency represented and making others available for purchase.

*Motion Presented by Mr. George Nelbach, New York State Tuberculosis and Health Association:*

On behalf of the agencies represented at the National Conference on Local Health Units, I move a resolution of thanks to the American Public Health Association for its wisdom and sound judgment for the privilege of participating in this Conference, and also to include in our gratitude Princeton University for making the meeting facilities available and also to the W. K. Kellogg Foundation for the grant of funds to the American Public Health Association which made the Conference possible.

#### SEWAGE RESEARCH

The Federation of Sewage Works Associations, through its Executive Secretary, W. H. Wisely, announces a grant of \$33,830 from the Research Grant Division of the National Institute of Health. "The object of the research

will be to evaluate existing methods of analysis of sewage and industrial wastes with respect to dependability and accuracy, and to devise where possible, improvements on entirely new methods . . . The research will be conducted in six selected laboratories, each being

under the direction of a member of the Federation's Standard Methods Committee."

The following laboratories have already been selected for certain phases of the work: Illinois State Water Survey; Mellen Institute; New York State Division of Laboratories and Research; Rutgers University, Department of Sanitation; Wisconsin State Laboratory of Hygiene.

#### UNITED STATES MAKES ISOTOPES AVAILABLE TO THE WORLD

At the recent fourth International Cancer Research Congress in St. Louis, announcement was made by President Truman lifting the ban against the exportation of radioactive isotopes to scientists of foreign countries. By this action of the United States Atomic Energy Commission, these important research tools became available for medical and biological investigations outside the United States.

The gathering of scientists from 35 countries and its President, Dr. E. V. Cowdry, Professor of Anatomy, Washington University, hailed this message as a "momentous event" of great significance to scientists and to mankind all over the world.

The message also gave impetus to the setting up of a world-wide organization against cancer, a by-product of which it is hoped will be an example in international coöperation in the diplomatic and political fields as well.

Australia was the first nation to avail itself of the privilege of purchasing isotopes. On September 5, 20 millicuries of phosphorus 32 for treatment of an urgent case of a blood disorder, polycythemia vera, were shipped by air to the Commonwealth X-ray and Radium Laboratory of Melbourne.

#### U. S. SENATE APPOINTS CITIZENS' ADVISORY COUNCIL OF SOCIAL SECURITY A Senate resolution adopted before

the adjournment in July of the Congress and sponsored by Senators Millikin of Colorado and George of Georgia has become effective, providing for a "full and complete investigation" of social security and the various proposals for enlarging the present program. An appropriation of \$25,000 has been made to implement the project.

Edward R. Stettinius, Jr., former Secretary of State and now Rector of the University of Virginia, has been appointed Chairman of the 17 man committee. Associate Chairman is Professor Sumner H. Slichter of Harvard University, who is also Chairman of the Research Advisory Board of the Committee on Economic Development.

Dr. Florence R. Sabin of Denver, Chairman of the Denver Board of Health and well known proponent of full-time public health service in Colorado, was made a member of the committee. Other members include Frank Bane, Chicago, Executive Director of the Council of State Governments; J. Douglas Brown of Princeton University; Nelson H. Cruikshank, Director of social insurance activities of the American Federation of Labor; Mary H. Donlon of New York, Chairman of the State Workmen's Compensation Board; William I. Myers of Ithaca, N. Y., Dean of the New York State College of Agriculture, and Emil Rieve, Vice-President of the Congress of Industrial Organizations.

#### DEGREE CHANGES AT NORTH CAROLINA

The School of Public Health of the University of North Carolina, Chapel Hill, has announced that with the beginning of the school year, September, 1947, the Degree of Master of Science in Public Health will no longer be awarded. The only degrees to be awarded will be the Master of Public Health, the Doctor of Public Health, the Master of Science in Sanitary Engineering, and the Certificate and Bachelor of Science in Public Health

Nursing. The largest group among the students to be affected by the change in degrees will be the health educators, who hereafter will receive the M.P.H. instead of the M.S.P.H.

#### WHO PUBLIC HEALTH FELLOWSHIPS

Of the approximately 200 fellowships that will be granted to public health specialists for study outside their own countries, 66 have already been provided by the Interim Commission of the World Health Organization. This is the first selection of doctors, nurses, and other public health workers under an exchange program whereby scientists and medical specialists will share in advances of medical knowledge on a world-wide basis.

The first group selected includes 18 fellows each from China and Yugoslavia, 15 from Czechoslovakia, 5 from Finland, 4 from Austria, 3 from Poland, 2 from Northern Korea, and 1 from Greece.

#### PHYSICIANS ADVISE ATOMIC ENERGY COMMISSION

The appointment has been announced of the Advisory Committee for Biology and Medicine of the United States Atomic Energy Commission which held its first meeting in Washington on September 11 principally to determine how the Commission should spend five million dollars appropriated by Congress for cancer research, and with reference to the head of the Division of Biology and Medicine of the A.E.C. The committee will study the basic policies relating to the medical, biological and health aspects of the Atomic Energy Program. This will include research on possible health hazards in the development of atomic energy and the extension of medical and biological research and development, and on the improvement of coöperative relationships with the Armed Forces and with the U. S. Public Health Service.

Among the members of the com-

mittee are Alan Gregg, M.D., Director for Medical Sciences, Rockefeller Foundation, New York, Chairman; Ernest W. Goodpasture, M.D., Dean of the School of Medicine and Professor of Pathology, Vanderbilt University, Nashville, Tenn.; A. Baird Hastings, Professor of Biochemistry, Harvard Medical School, Boston, Mass.; and Joseph T. Wearn, M.D., Dean of the School of Medicine and Professor of Medicine, Western Reserve University, Cleveland, Ohio.

#### MASSACHUSETTS PUBLIC HEALTH CONFERENCE

A Conference under the sponsorship of the University of Massachusetts, the Massachusetts Public Health Association, and the Massachusetts Department of Public Health, was held in Amherst, September 11-12. Local arrangements were in charge of Professor Ralph L. France of the Department of Bacteriology, University of Massachusetts.

The 2 day session included addresses by Dr. Charles F. Wilinsky, President of the Massachusetts Public Health Association; Dr. Hugo Muench, Harvard School of Public Health; Dr. Vlado A. Getting, Commissioner of Public Health; and by a group of speakers who reviewed developing plans for complete coverage of the state with full-time local health units. Among these were Dr. Alfred L. Frechette, Health Officer of Brookline; Charles A. Freck, Queensboro Tuberculosis and Health Association; Dr. Haven Emerson, Chairman of the Subcommittee on Local Health Units, American Public Health Association; Dr. Hugh R. Leavell, Harvard School of Public Health; and Dr. Reginald M. Atwater, Executive Secretary, American Public Health Association. The dinner session was addressed by Dr. Herman E. Hilleboe, newly appointed Commissioner of Health of New York State.

Other speakers included Dr. John F.

Conlon, Director of Medical Education and Information, Massachusetts Medical Society; Miss Mildred Lant, Assistant Director of Public Health Nursing, New York City Department of Health; Dr. Walter Mallmann, Professor of Bacteriology, Michigan State College; Professor Gordon M. Fair, Harvard School of Engineering; Dr. Geoffrey Edsall, Division of Biological Laboratories; Dr. Alton S. Pope, Deputy Commissioner of Public Health; also Lewis Dodson and Walter Snyder of the National Sanitation Foundation, Ann Arbor, Mich.

Total attendance was about 400. It is anticipated that this will become an annual event, and tentative dates have been set for June 16 and 17 in Amherst in 1948.

#### HANSEN MEDAL TO PROFESSOR WAKSMAN

During the Fourth International Microbiological Congress held in Copenhagen, Denmark, July 20-26, the Emil Hansen Medal and an award of 5,000 kroner was presented to Professor S. A. Waksman, Agricultural Experiment Station, New Brunswick, N. J., for his studies in the field of the antibiotics. Professor Waksman announced that the money presented would be used for the support of work now being carried out by a Danish graduate student at New Brunswick.

#### DR. HELMHOLZ HONORED

At the recent International Congress of Pediatrics in New York, Henry F. Helmholtz, M.D., Professor of Pediatrics, Mayo Foundation, University of Minnesota, was awarded certificates of honorary membership in the Latin American Division of the American Academy of Pediatrics and in the Sociedade Brasileira de Pediatrics. He also was decorated in the National Order of Merit of Carlos J. Finlay in the grade of Commander from the Cuban Government in recognition of his services in

furthering pediatric practice in Latin American countries.

#### OPPORTUNITIES FOR NAVAL RESERVE MEDICAL OFFICERS

The Naval Air Reserve Training Command, with headquarters at Naval Air Station, Glenview, Ill., has 17 nationally located Naval Air Stations and 4 Naval Air Reserve Training Units at which Naval Reserve Medical Officers may serve on active duty with full pay and allowances and with the privilege of returning to civilian life at any time upon request. Additional details may be obtained from Chief of Naval Air Reserve Training, Naval Air Station, Glenview, Ill.

#### ONE YEAR OF RAT CONTROL

The monthly news sheet, "Rat Controller," July, 1943, of the St. Louis Health Division, makes special recognition of the completion of the first year of activity of the recently established Rat Control Section. The activities of the Section have been divided among four general services. Emphasis has been placed on education of the public through the Education Service. Actual long-range field control has been divided between the Rat-Stoppage Service and the Rat Eradication Service. The fourth Service, that of Inspection-Enforcement, handles complaints requiring day-to-day activities. A full-time biologist has been added to the staff to conduct biological studies and to keep informed on the presence of murine typhus. All of this work, under the direction of John L. Sadowski, Chief of the Rat Control Section, is an outcome of the Rat Control Ordinance adopted on June 26, 1946. J. F. Bredeck, M.D., Dr.P.H., is Health Commissioner.

#### TUBERCULOSIS RESEARCH CENTER TO SUPPLY BCG VACCINE

The recent Illinois Legislature authorized the construction and maintenance

of a tuberculosis research hospital in conjunction with the University of Illinois College of Medicine, Chicago. It includes an appropriation of \$361,250. The Institute for Tuberculosis Prevention, which will be built on the medical campus and be run in close coöperation with the City of Chicago Municipal Tuberculosis Sanitarium, will supply BCG vaccine for the U. S. Public Health Service, now carrying on a project in Columbus, Ga., for a long-range study of the vaccine. The vaccine, which can be manufactured at a cost of about half a cent per dose, will be distributed to regular health agencies, city, state, and federal, but not on commercial lines.

The Research Foundation Board headed by Park Livingston, president of the trustees of the University of Illinois College of Medicine, Chicago, has been set up to raise additional funds for operation of the Institute.

#### NEW NUTRITION DEPARTMENT AT NORTHWESTERN UNIVERSITY

Northwestern University and the Spies Committee for Clinical Research will establish in Chicago a center for medical research in the field of nutrition and metabolism. The agreement provides that Tom D. Spies, M.D., Associate Professor of Medicine at the University of Cincinnati, will become Professor of Nutrition and Metabolism and Chairman of a new department in this field in the Medical School of Northwestern University. Following his resignation from the University of Cincinnati, he assumed his new duties September 1, at which time the Spies Committee severed its relationship with the University of Cincinnati.

The agreement further provides that the committee will grant to the university at least \$150,000 annually for five years to be used for the expenses of this department and for research carried on under Dr. Spies. The Spies Committee for Clinical Research was organized in

1943. Dr. Spies in 1937 organized, and has since directed, the University of Cincinnati studies in nutrition at the Hillman Hospital Nutrition Clinic, Birmingham, Ala., and this work will continue under his direction.

#### SAN FRANCISCO COMMUNICABLE DISEASE PRECAUTIONS

Dr. J. C. Geiger, Director of Public Health, City and County of San Francisco, announces that because of the recent transportation of cases of communicable disease into San Francisco by airplane, the following necessary precautions have been suggested and made mandatory as far as San Francisco is concerned:

1. Permission should be obtained for trans-  
ferral of case
  - a. local health authority
  - b. state health authority of place of destination
  - c. local health authority of place of destination
2. If disease has been recognized or classified as suspected disease, precautions are mandatory,
  - A. If spread by contact, attendants should be required to wear surgical gown over clothes, face masks, even goggles. Such garments and materials should be gathered in suitable bags (paper or cloth) and sterilized by autoclave heat or burned in suitable ovens.
  - B. The plane itself must be aired thoroughly, interior washed by soap and water, and if disease is spread by insect vectors (mosquitoes, fleas, lice, etc.) additionally sprayed with suitable aerosol vapors.
3. Since a case of communicable disease should not travel in a public plane conveyance with other passengers, there is no need for protection of fellow passengers other than attendants.
4. Utensils used by patients should be kept separate and boiled for ten (10) minutes
5. Blankets and other coverings of patient must be sterilized by sunning, by steam and laundering.



6. The airplane crew must avoid contact with patient and attendants. The plane must be fully equipped with proper bed, heating, first aid outfits, drugs, and oxygen.
7. Patients should be moved to and from plane by special ambulances.
8. Airfields attendants must offer all and immediate clearance necessary to proper handling of case

Explanation: The airplane and its value in swiftly and safely moving wounded was amply demonstrated in war II. Similar use of the airplane in civilian life has unlimited possibilities in saving time and reducing mortality from disease and accident. It appears to be a prime necessity in all areas where airport facilities are being so well developed as in San Francisco.

J. C. GEIGER, M.D.

Director of Public Health  
City and County of  
San Francisco, Calif.

DR. FLORENCE R. SABIN ELECTED  
HONORARY FELLOW OF A.P.H.A.

At the meeting of the Governing Council in Atlantic City, N. J., on October 8, Florence R. Sabin, M.D., of Denver, Colo., was unanimously elected an Honorary Fellow of the Association in recognition of the extraordinary achievements which she has spearheaded in the public health program of Colorado. Dr. Sabin holds among other honors the Jane Addams Medal for Distinguished Service, the Trudeau Medal of the National Tuberculosis Association, and she is currently the President of the Western Branch of the American Public Health Association and President of the Denver Board of Health. Dr. Sabin, who is a native of Colorado, recently retired as a member of the Rockefeller Institute for Medical Research after an extended career in science. Dr. Sabin was the featured speaker at the Princeton Conference on Local Health Units sponsored by the American Public Health Association, September 8-10.

## PERSONALS

### Central States

HAROLD S. ADAMS,\* has been appointed Director of the Division of Hotel and Resort Inspection, Section of Environmental Sanitation, Minnesota Department of Health, succeeding THEODORE T. WOLD who resigned to enter private business. Mr. Adams will continue to serve as lecturer in the School of Public Health of the University of Minnesota. He was formerly Chief of the Bureau of Environmental Hygiene, Minneapolis Department of Health. He recently wrote *Milk and Food Sanitation Practice* which was published by the Commonwealth Fund.

JOHN BUXELL,\* Engineering Director of the Health Division of the City of St. Louis, Mo., is on leave for a year's study toward a Master's degree in Public Health, at the University of Minnesota, Minneapolis, Minn.

ELIZABETH COLLINS has been appointed Consultant in Nutrition to the Public Health Nursing staff of the Cleveland Division of Health, Cleveland, Ohio.

MARY CATHERINE DONOVAN took charge of the Public Relations Department at the Cleveland Museum of Health, September 1. She has been the Director of Public Relations at Notre Dame College, South Euclid, Ohio, for the past three and one-half years.

### CHANGES IN HEALTH PERSONNEL IN KANSAS:

FRED MAYES, M.D.,† Assistant State Health Officer and Director, Division of Local Health Administration, Kansas State Board of Health, has been granted educational leave to complete his work on a Master's degree in Public Health at Harvard University.

THERESA JENNIGES\* has been appointed Director of Public Health Nursing Services for the State Board of Health. Her public health experience includes work at local, state, and national levels with the Hennepin County Rural Nursing Services, Minnesota; Instructor, Public Health Nursing, Loyola University; Supervisor, Maywood Teaching Center, Chicago; Associate Public Health Nursing Consultant, U. S. Public Health Service, assigned to South Dakota as Supervising Nurse and Senior Assistant Nurse Officer (R) assigned to Oregon and Georgia State Health Departments.

VERNON M. WINKLE, M.D.,† formerly Assistant Health Officer of the Topeka City-Shawnee County Health Department, Kan., has been appointed Acting Director of the Division of Local Health Administration in the absence of Dr. MAYES.

A. B. ROSENFELD, M.D., M.P.H.,† has been appointed Director of State Health District No. 6, comprising 7 of the counties of Minnesota, with headquarters in Minneapolis. He was formerly Director of School Health of the Hibbing, Minn., public schools.

LEONA RUBBELKE† and RUTH ANDERSON have been appointed respectively as Nursing Consultant in Maternal and Child Hygiene and as Nursing Consultant for the Hospital Construction Program of the North Dakota State Department of Health.

#### Eastern States

PAUL BENJAMIN recently resigned as Secretary of the Pennsylvania Charities Association to become Executive Secretary of the Related Activities Council of Schenectady, N. Y. He

has been succeeded in Pennsylvania by HUGH JACKSON, who has had experience with a number of social agencies, the New York State Charities Aid Association, UNRRA, and, most recently, the National Social Welfare Assembly.

ELLIS H. CHAMPLIN,† who has been serving as Acting Director of the Division of Health and Physical Education of the New York State Education Department in Albany since 1945, has been appointed Director of the Division effective September 11. Mr. Champlin was formerly Chief of the Bureau of Physical Education in the Division he now directs.

LOUIS L. FELDMAN,† who before his recent military service was on the staff of the Committee on Administrative Practice, American Public Health Association, has been appointed underwriter and assistant to the general manager of the Health Insurance Plan of Greater New York.

S. S. LIFSON\* has been appointed Assistant Director, Community Organization, of the National Health Council, New York, N. Y. Mr. Lifson was formerly Health Education Consultant with the U. S. Public Health Service, District 1, New York, N. Y.

CLARICE LEAVELL PENNOCK, on September 1 began her duties as Secretary of the National Conference on Family Life. She was formerly Executive Secretary of the Association of Junior Leagues of America, New York, N. Y.

HENRY B. MAKOVER, M.D.,† formerly Senior Surgeon, U. S. Public Health Service, and recently Associate Director of Montefiore Hospital for Chronic Diseases, New York, where he surveyed the possibilities of, and recommended a plan for, a hospital group-practice unit, has assumed the post of health and medical consultant to the Federation of Jewish Charities of Philadelphia, Pa.

JEROME S. PETERSON, M.D.,\* on a year's

\* Fellow, A.P.H.A.  
† Member, A.P.H.A.

leave of absence as District Health Officer of the New York City Department of Health, returned to China on September 1 to serve as epidemiologist for the World Health Organization. His work will be mainly concerned with the study and control of cholera, bubonic and pneumonic plague, and kala-azar. For 10 months last year he served with the UNRRA as Chief Medical Officer in China.

BERTRAND E. ROBERTS, M.D.,† after 25 years' service in the New York State Department of Health retired recently. With the department since 1922, he was first epidemiologist and for the past 17 years District State Health Officer in the Poughkeepsie area.

NELSON W. STROHM, M.D.,† has been appointed Director of Tuberculosis Control in the Buffalo, N. Y., Department of Health. He has been associated with the chest clinic of the Division of Communicable Diseases of the Buffalo Health Department since 1919, and since February 1 of this year has been chief of the diagnostic clinic of the health department.

JESSIE TURNBULL, Administrator of Elizabeth Steel Magee Hospital, Pittsburgh, Pa., was elected the first woman President-Elect of the American College of Hospital Administrators at its 13th annual meeting, September 22, at St. Louis, Mo.

#### Southern States

RICHARD B. BLACKWELL, M.D., who has assumed the duties of Health Officer of Rockbridge County, Va., succeeds ROBERT P. COOKE, M.D., who retired after serving 20 years as Health Officer. Dr. Blackwell recently retired from the navy after 30 years of service.

CLARENCE L. GUYTON, M.D.,† has resigned as Director of the South Carolina State Board of Health Division of Venereal Disease and Cancer Control and accepted the appointment of City Health Commissioner at Greenville, S. C. Dr. Guyton organized and developed the state's cancer control program.

SAMUEL J. HAWKINS has been loaned by the U. S. Public Health Service, District 2, Richmond, Va., to the Bureau of Venereal Disease Control, West Virginia State Department of Health, as Field Epidemiologist.

JAMES G. MILLER, M.D., Chief of the Clinical Psychology Section of the neuro-psychiatric division of the Veterans Administration, Washington, D. C., has been appointed Chairman of the Department of Psychology at the University of Chicago, Chicago, Ill. Effective January 1, 1948, his appointment carries the rank of professor of psychiatry and psychology.

LEWIS J. MOORMAN, M.D., one of the founders and for the last 29 years president of the Oklahoma County Health Association, has been made "honorary president for life" of that organization. He assisted in the organization of the Oklahoma City Tuberculosis Society and was the first president in 1918.

W. PHILLIPS PALMER† assumed his duties as Consultant in Administration and Public Relations with the West Virginia State Department of Health, September 1.

EVELYN T. STOTZ, former Lieutenant Commander in the U. S. Navy Nurse Corps, has been appointed Nursing Director of the National Blood Program of the American National Red Cross, Washington, D. C.

GENEVA K. WATSON,† for 17 years a teacher in the Charlottesville, Va., schools, has been appointed by the Virginia Tuberculosis Association to supervise health education services in

\* Fellow, A.P.H.A.

† Member, A.P.H.A.

# American Journal of Public Health and THE NATION'S HEALTH

---

Volume 37

December, 1947

Number 12

## The Stems and Roots of Public Health Practice\*

HARRY S. MUSTARD, M.D., F.A.P.H.A.

*Director, Columbia University School of Public Health, New York, N. Y.*

THIS is the seventy-fifth anniversary of the founding of the American Public Health Association. The records indicate that on April 18, 1872, a group of physicians interested in public health matters held a morning conference in New York City. Evidently, they engendered an enthusiasm among themselves, for they held another session that afternoon and laid the groundwork for the formal establishment of a public health association, national in scope. The Association as such came into existence with the adoption of a constitution at a meeting held in Long Branch, N. J., September 12 of the same year.

It would be pleasant to go into these early events in detail, to pay tribute to Dr. Stephen Smith, the first president of the Association, and to cite the names and list the contributions of the Association's illustrious forebears. But of more practical importance than such an ancestral excursion is the institution of a search for those influences that have

made this Association and public health so different in 1947 from what it was in 1872. One might dispose of these changes by saying that the American Public Health Association and the practice of public health have grown with the times. But that is not a sufficient answer. The differences between then and now are too pronounced in both character and extent to be accounted for as mere shifting in a surface pattern. Their quality and quantity suggest, rather, that new and powerful influences were introduced at some one time, or intermittently, or continuingly, in the past seventy-five years.

As a starting point in this search for causes and influences, it seems worth while to study the social conditions that prevailed in 1872. For whatever it may mean, General Grant was in the White House. The population of the United States was about 39 million. The population of New York City was under a million and a half, and Los Angeles numbered less than 6,000. There were but 38 states and only 14 of them had a population of over a million. The population concentration was 13 persons per square mile. Indian skirmishes

---

\* Presidential Address presented before the American Public Health Association at the Seventy-fifth Annual Meeting in Atlantic City, N. J., October 7, 1947.

were not a thing of the past and Custer was yet to be massacred. Vast cattle and farming areas were being opened up, manufacture, industry, and transportation were, comparatively speaking, in their infancy, as were the giant corporations and labor unions. The Federal Constitution was less than a hundred years old, but an interpretation by force of arms, only seven years before, suggested that a more powerful national government would exert jurisdiction in civil matters previously considered to be in the sphere of the states. While the nation was still an agricultural one, with 80 per cent of its population rural, the cities were growing. Vast immigrant hordes streamed into them and lived in abject poverty. Social consciousness was ill-defined and society did not expect government to expend its funds for social welfare. If there was a national concept or ideology, it was that each man must rise and shine, and conversely, there was the granite-hard philosophy that if one made no effort to rise he would most certainly not bask in the warmth of sunshine produced by others.

The half century preceding the year 1872 had been a time of epidemics. Cholera had entered the United States in 1832 and had been devastating in its effects. Another outbreak began in 1848 and went across the continent to California with the Forty-niners. A third cholera epidemic flared in 1866, and a fourth in 1873, the last particularly affecting the Mississippi Valley. Typhus fever had appeared intermittently in our Atlantic ports as immigrants poured in. Yellow fever epidemics came with rather distressing regularity in the South Atlantic and Gulf ports and occasionally much farther north. There were, too, recurring epidemics of non-exotic diseases—smallpox, typhoid fever, diphtheria, meningitis, malaria, dysentery, and others. Over and above those diseases that manifested themselves in

epidemic form, there was a high incidence of most of the ordinary human illnesses. But because the epidemics were more dramatic and terrifying, non-epidemic disease did not cause much public concern. Death rates were quite high as evidenced by the fact that in many of the cities in the middle of the century, deaths of children under one year of age made up 25 to 30 per cent of the total mortality, as against the 7 per cent of today. Life expectancy was about 40 years, whereas now it is 64.

The knowledge and mechanisms available for the practice of public health in 1872 were comparatively limited. Pasteur was still preoccupied with his studies on fermentation and pasteurization, and bacteriology was in an embryonic stage. There had been, of course, speculation and individual convictions as to the role of micro-organisms in the causation of disease, but the first bacteria (anthrax) had not yet been grown in pure culture. Pettenkofer's XYZ doctrine on cholera had just been crystallized. Snow's essay on cholera had been published in 1849, and Budd's on typhoid fever was due to appear in 1874. Shattuck's *Sanitary Survey of Massachusetts* had been written in 1850, but was destined to gather some nineteen years of attic dust before his recommendations were acted upon. When the Association was formed, the United States Marine Hospital Service had been in existence for some three-quarters of a century but had been put on a national basis only two years before. The first supervising surgeon of that Service had just been appointed, and the Service's first *Annual Report* was published the year the Association was founded. Only five states had established state boards of health, Louisiana, Massachusetts, California, Minnesota, Virginia. The American Medical Association was 25 years old.

In the social environment that existed, in view of the problems that presented themselves, and in light of scientific knowledge then available, it is not surprising but was, rather, inevitable that public health activities should be focused on environmental sanitation and quarantine for the control of communicable diseases, and that public health practice was visualized as but a defensive mechanism, to be called into play in emergency.

But the situation did not remain static, for there was an immediate expansion of bacteriological knowledge and a strengthening of the epidemiological armamentation for analysis of the mass phenomena of disease and for their control. Further, it is to be noted that the advances made and the contrast between public health conditions and practices of three-quarters of a century ago and now do not relate to communicable diseases alone. Nor is the increase in scientific information limited to growth of knowledge in that field. In extending the bounds of knowledge and in the application of it, the resources of diverse disciplines and sciences, and even of the arts, have been utilized and coördinated: biology, botany, chemistry, dentistry, education, engineering, mathematics, medicine, nursing, pharmacology, physics, physiology, psychology, and others including administration.

Public health practice, on its part, has applied this newer scientific knowledge in fields whose boundaries are so broad that their limits are not yet defined. The prevention of disease is emphasized as an essential for the public health, but it is also recognized that the restoration of health to those who are sick is a matter of public health concern. Any disease or factor that is causing a considerable mortality or morbidity is one of which public health practice must take cognizance. Thus the degenerative diseases, cancer, or

even accidents, present public health problems. Also, in addition to its more or less conventional duties, public health practice has found itself bearing a responsibility in industrial hygiene, in the nutritional status of the public, in the problems of mental hygiene and psychiatry, in dentistry, and in a variety of other health problems ranging from genetics to geriatrics. Many of these involve fundamental and applied research; and as this phase of public health progress is scrutinized, scientific knowledge is recognized as a tap root from which public health advances stem.

In the area of social philosophy and political economy, the situation of today is also vastly different from that of seventy-five years ago. Government could not remain, as it was in earlier days, a vague and shadowy thing of which was expected only the maintenance of law and order and not too much of that. It was inevitable, as population increased and as life became more complex, that society should exercise, through government, a more continuing guidance of community affairs. And as communities developed it became obvious, even to the most individualistic citizen that, by putting some of his money in the form of taxes, into a pool also paid into by others, he could ensure himself communal and individual benefits that it would be difficult to obtain if he acted alone. The number and variety of benefits which the citizen elected to procure in this manner has steadily increased and has come to include funds for the purchase of public health services. But, it is to be noted that, whereas in 1872 such services were paid for and provided on a local basis, the state and federal governments have now come strongly into the field, just how strongly, may be appreciated by looking at 1947 as we did 1872. Here is what we find:

General Grant is no longer in the White House. The population is now

three times as great as it was then, and there are 44 persons per square mile. Los Angeles has reached and passed the 6,000 population which it had as a goal in 1870. Only 14 states have populations less than a million. The nation has become rich, is getting a little gray haired and, in some matters, is on the point of disillusionment. If manufacture, industry, transportation, corporations and labor unions have not passed the stage of infancy, then they are remarkably precocious. The trend toward vesting authority in the federal government is no longer a gentle flow, but a roaring flood and, if a constitutional rock dams up the waters of federal power, it is either by-passed through a new channel, as by the conditioned grant, or is blasted out, as by the Sixteenth Amendment which removed the constitutional prohibition of direct federal tax on citizens, except on a per capita basis.

It is difficult to say whether or not the range of activities supported partly by the federal government, including public health services, will be continued indefinitely. But, as of today, and regardless of whether one approves or disapproves, the trend toward expansion of power of the federal government, the trend toward social legislation, and the vast financial resources derived from the income tax, have made it possible to extend and improve public health services as could not otherwise have been done. This being the case, one must recognize that social and governmental concepts and resources exert powerful influences upon public health practice, and in turn constitute a root from which public health stems.

One must recognize, too, as a sort of compound root, all those elements that go to make up the standard of living of the population: communal and individual standards; the educational level; the habits of hygiene; information on matters of health; food reason-

able in amount and of proper nutritional values; wages that make these things possible and encourage a bit of recreation rather than mental depression from an attempt to make ends meet. And contributing toward the ensurance of this standard of living is the kind and amount of medical care available to each community and to each person in each community.

There is another root of public health and of public health practice that is even more complex and to some extent intangible. This is the professional and personal quality of those practising public health and the wisdom and vision of their leaders. Without these assets, many of the other roots of public health would fail to develop, or would produce a rank growth and bitter fruit.

And now where do we find ourselves in so far as concerns the public health services that we, of this Association, are rendering in our several private or public capacities? Are these services good, fair, or poor? Are they adequate? These questions, I think, may be partly answered by saying that where we have public health services, they are fair to good. But immediately we must qualify this by admitting that one-third of the people of the United States have no local public health service. We must recognize, too, that even where we have such services, there are more fair ones than good ones.

But if scientific knowledge is the root from which stems public health practice, and if society is susceptible to providing funds as a soil in which this practice may grow, what may we do in attempts to ensure that the leaves of the tree shall really serve for the healing of the nations? No person may answer this completely or without error, but I venture to make certain suggestions as follows:

I suggest that the Association and that we as individuals, do even more than we have done, to further the provision of

local health service for every community in the nation.

I suggest that it would further the provisions of local health units for the nation if federal funds in the support of public health work were provided and distributed somewhat as is set forth in Public Law 725, Hospital Survey and Construction Act, wherein needs and plans for complete state coverage must be presented, and systematically implemented. Federal grants to states, in aid of public health work, do not at present ensure similar state-wide development.

I suggest that the mere provision of local health departments for all the nation is not enough; that strong and competent state health departments, with properly related district or regional organizations, are essential; and I express to you the hope that as we gain greater scientific knowledge and organizational competence our federal health services may be better coördinated.

I suggest that this Association and public health workers in general avoid the danger of assuming, and of permitting the public to assume, that merely because a health department is in existence it necessarily meets the needs of the community or state. To this end the Association might well reëmphasize its efforts in support of high professional standards for all categories of public health workers; and emphasize and reëmphasize that even qualified workers, unless in sufficient number, cannot render the public health service that is desirable.

I suggest that there is probable danger in the growing trend toward adding a representative of every sub-specialty of public health to every small health department; that the number of such sub-specialties is becoming alarmingly great, that often they overlap, with confusion to themselves and the public. These things the Association might well

consider in conference with other organizations concerned.

I suggest that, just as the products of research cannot be delivered to the people without proper organization of a sufficient number of qualified workers, so is it impossible for public health organizations to give maximum benefits to the people unless there is ever-increasing scientific knowledge. I therefore urge your continued interest in governmental and philanthropic support of research: research at national, state, and local levels, fundamental and applied research, research in the laboratory and in the field; coördinated and individual research, research by government and by voluntary health agencies; research fellows and fellowships.

I suggest to some governors and mayors that neither old acquaintance-ship with a physician nor obligation to his political friends, constitutes ground for appointing that physician as state or city health officer; that competence in public health matters is not acquired through practice in a private professional capacity, or by having served transiently as an officer in a professional association. To other governors and mayors I offer congratulations on the courage they have exhibited in removing public health from politics, and on the integrity and wisdom they have shown in appointing health officers.

I suggest that to a very marked extent public health work is being reoriented by forces quite outside itself; that society is exerting ever-increasing pressure for new and expanding activities that relate to the public health: pressures for expansion and formalizations in mental hygiene, hospitalization, medical care, the hygiene of housing, research. Some of these undertakings require sound organization, wise administration, and proper coördination with already existing health work and with each other. In all of them it is imperative that those who participate possess



high professional qualifications. The demand that these things be incorporated in public health programs is very strong, and if the public health agencies are unwilling to accept their proper share of responsibilities in these areas, then other agencies, possibly ill-suited, will attempt to meet the need. I suggest that neither a nostalgia for the simpler days of public health work nor a disapproval of some of the implications in a changing social order is sufficient ground for refusing to meet this responsibility. In the public interest, a decision as to what part we shall play should be based upon reason and a sense of reality rather than upon an emotional reaction.

I suggest that the American Public Health Association carry on vigorously its policy of working coöperatively with other organizations interested in the public health; that in relationships with other organizations we emphasize and exploit areas of agreement rather than of disagreement.

I suggest that this Association do all that it is proper for it to do to further the development of sound international

public health organization and professional associations.

I suggest to you that the American Public Health Association is rather a fine organization; that we owe to the Executive Secretary and his staff our deep gratitude for the efforts and genius they have put into the organization of this meeting, and for their unremitting attention to the Association's opportunities and duties.

And now in retrospect and prospect, it seems that we may conclude that the four most powerful influences that have shaped public health affairs in the past, and which will continue to shape them in the future, are advances in scientific knowledge, the direction taken by economic and social evolution, the standards of living of the population, and the quality and availability of medical care and of professional public health workers. Since the founding of this Association, its members have contributed to the acquisition of new knowledge and to its application for the benefit of public health.

May our commendable qualities be enhanced as the years pass.

---

## Puerto Rico Invites Public Health Visitors to Its February Meeting

Dr. Guillermo Arbona, President of the Puerto Rico Public Health Association, San Juan, Puerto Rico, and Nelson Biaggi, Secretary, extended an invitation during the 75th Annual Meeting of the A.P.H.A. in Atlantic City to all public health workers to share in the meeting of the Puerto Rico Public Health Association called for early

February in San Juan. It was hoped and expected that a team of speakers would attend this meeting, and those who would enjoy a vacation at that time of the year in a tropical climate are invited to communicate with the A.P.H.A. office with reference to joining a group who would go and return by steamship or air.

# Hospital Relations

## The Hospital as an Instrument in a Public Health Program \*

VANE M. HOGE, M.D.

*Medical Director, Chief, Division of Hospital Facilities, U. S. Public Health Service, Washington, D. C.*

A LITTLE more than a year has passed since the Hospital Survey and Construction Act became law. It is safe to assume that most health officers are now familiar with the broad outlines of the national program, which has now progressed to the point where actual construction of hospitals and public health centers will soon be under way.

There is a tendency in most discussions of the Act to speak of it as a hospital program, with less emphasis on its significance from the point of view of public health. Certainly the Act is a major development in the hospital field. For the first time, the federal government has assumed a share of the responsibility for developing a hospital plant capable of serving the normal, peacetime needs of all of our people. For the first time, also, the planning of hospital facilities on the basis of need, as demonstrated by comprehensive surveys, has been adopted as a national policy. And while the principle of federal aid in hospital construction is not new, since it has appeared previously in programs of an emergency nature, the present program is far and away the most comprehensive ever undertaken in this country.

The apparent prominence of hospitals

in the program has no doubt been encouraged by the title of the Act, and by the fact that the term "hospitals" has been stretched, by the magic of legal definition, to include public health centers, so that the latter term is less often used. In the public mind, too, the hospital has far more emotional appeal than the health department. The soldier is more popular than the peacemaker, and the fireman more popular than the building inspector. The man who comes dashing to the rescue after the damage has begun is the hero; the one who prevents it from happening at all is merely a fussbudget.

Nevertheless, it is the intention of both the Law and of its administration that public health facilities shall have an important place. To my mind, one of the most significant aspects of this program is its relationship to the field of public health, not only in the specific assistance which it provides, but also, and perhaps more importantly in the long run, in the basic concepts which it embodies.

First of all, of course, the Act authorizes grants-in-aid to the state to assist in the construction of public health facilities. In doing so, it recognizes the fact that health departments can no longer be tucked away in the basements of obsolete county buildings if they are to do an adequate job. Second, each state is required to draw up an overall plan for the development of public

\* Presented before the Health Officers Section of the American Public Health Association at the Seventy-fifth Annual Meeting in Atlantic City, N. J., October 10, 1947.

health facilities as well as for hospitals. It is true that these plans will not necessarily cover the areas which are not now served by full-time health departments. Their development, however, will promote coördinated planning for new facilities, and, it is hoped, will also serve as a stimulus to the extension of present services by calling attention to existing gaps and deficiencies. A modern facility provides strong encouragement for the provision of additional services.

Over and above the immediate practical benefits which health departments will derive from the Act is the implicit recognition of a vastly broadened concept of public health. In recognizing the adequacy of hospital as well as public health facilities as a matter of public concern, in dealing with both in the same legislation, and in vesting the administration of the program in the federal and state public health agencies, Congress has demonstrated its awareness of the interdependence of preventive and curative medicine, and of the importance of both to the national welfare.

This broadened concept is, of course, a logical development, in line with the trend of professional and public opinion. It is a commonplace to say that the field of public health has vastly expanded, and that the health officer of a generation ago would scarcely recognize his profession today. There has been a great increase in the scope of preventive measures, and in the extent to which they are applied. The early diagnosis, isolation, and treatment of cases of communicable disease are recognized as an indispensable element in the control of these diseases, so that individual medical care, in these fields at least, has become accepted as a necessary function of health departments. The recent development of mass attacks on tuberculosis and venereal disease, which do not employ the immunological approach, has brought health departments into in-

creasing contact with the individual patient, and has necessitated a closer working relationship with hospitals and with private practitioners.

Today, the chronic diseases and the degenerative conditions of later life have largely replaced the communicable diseases as our chief public health problems. As the proportion of older persons in our population increases, and as our control of communicable diseases is perfected, this trend will become even more apparent. To date, we have not succeeded in applying mass methods to the control of these conditions, and it appears probable that we shall have to rely, in the main, on the individual approach.

Thus, the line between the field of public health and that of individual hospital and medical care is growing more and more indistinct. Their goals, which have always been closely related, are becoming more and more identical. To an ever-increasing extent, they are using the same methods, employing the same types of personnel, and using the same kinds of equipment. In the interest of efficiency and of better service, closer integration of hospitals and health departments is being urged by leaders in both fields.

As we have noted, the Hospital Survey and Construction Act implicitly recognizes this situation. It encourages the integration of the two fields to a certain extent, since it gives the same agency the responsibility for planning facilities to serve both purposes. In practice, we are going one step further, and encouraging the inclusion of health department facilities in hospital buildings where this appears desirable and practicable. This, we hope, will eventually lead to the development of the truly integrated type of facility which can best serve the needs of public health today and in the future—the community health center, in which preventive and curative medicine are joined

in a broad and unified program, designed to serve the total health needs of the total population.

Such an integration, of course, cannot be brought about by a wave of the legislative wand. The problems of integration, particularly in view of the number of hospitals which are privately controlled, are much too varied and complex to be solved by national legislation, or by state legislation either for that matter. These problems can best be solved by voluntary working relationships between the individual organizations and institutions concerned.

We are amply justified, then, in speaking of the entire hospital survey and construction program as a public health measure. Our hospitals, even though privately owned or operated by other governmental agencies, are essential instruments in any broadly conceived public health program.

If we accept this concept, we must accept also the responsibility for taking an active and informed interest in the development of adequate hospital facilities, whether or not we are directly concerned in the formal program. It may be appropriate, therefore, to review the techniques which we have found to be necessary in carrying out the purposes of the Act.

First of all, there must be a careful study of the need for hospitals and health centers in relation to the extent of the problem of medical care, the requirements of preventive medicine, and the preservation of the health of the community, the area, and the state as a whole. These studies are now being conducted in all of our states and territories, by state agencies appointed for this purpose. An adequate study requires the services of experts in many fields—hospital administration, general medicine, public health, hospital architecture, economics and finance. It also requires the aid of community organizations, professional associations, and

official and voluntary agencies concerned with hospital and medical services. It involves not only the assembling of data on population, incidence and prevalence of disease, economic status and existing facilities, but also expert evaluation of the problems of providing adequate services.

With the aid of the data thus assembled, the state then proceeds to develop a master plan for hospital and health center construction, to serve all areas and all population groups. Naturally such a plan will go far beyond what can be accomplished right away. Selection will be necessary; and this is provided for by the setting up of a priority list of projects.

Over the past year the states have made remarkable progress in this direction. As of today, more than half the states have evaluated their health assets and completed long-range plans for their betterment.

The Hospital Survey and Construction Act sets forth certain standards as to the number of beds which are to be considered adequate for planning purposes. For the state as a whole, the plan is to provide  $4\frac{1}{2}$  general hospital beds for every 1,000 people, 5 beds in hospitals for mental disease, and 2 in hospitals for chronic disease. Facilities for tuberculosis patients are to be planned on the basis of  $2\frac{1}{2}$  beds for each annual death from this disease, averaged over a period of years. One public health center is to be planned for every 30,000 people, except that sparsely settled states may provide one per 20,000.

Tuberculosis, chronic, and mental disease hospitals may be planned on a state-wide basis. However, like general hospitals, in order to fulfil their mission they should be near the people they serve. General hospitals are best planned on an area basis, area meaning the logical service area of an existing or proposed hospital center. In the

base area, in which the most highly specialized services are available, the ratio will be at least  $4\frac{1}{2}$  beds per 1,000. Intermediate and rural areas will plan for fewer beds, with the excess allowed allocated to the larger centers upon which they depend for specialized care. By planning hospitals according to areas, it is possible to incorporate them into a coordinated hospital system, through which the smaller hospitals can receive services from the larger institutions and refer patients to them when necessary.

When the state plan is completed, it is submitted to the Public Health Service, where it is reviewed for conformity with the requirements of the Hospital Survey and Construction Act before approval. Once the plan has been approved, the state agency must determine which communities are ready and able to go ahead with specific projects.

If—as will probably be the case—applications are received for more hospitals than can be aided from the state's allotment of federal funds, the question of priorities becomes of primary importance. The state plan will assign priorities to the various areas of the state, top priorities being given to projects for which the relative need is greatest, those in rural and low-income areas. As the program progresses, the states will review their plans at intervals, reevaluating the priorities.

Recruitment and training of personnel is another necessary technique for reaching our basic objectives. Our present hospitals are hampered by a lack of personnel of many kinds. The effective use of additional facilities will be sharply limited unless personnel training proceeds apace.

Essentially, there are three lines of attack on this problem. First is the expansion of training. Second is the efficient utilization of the personnel we have. Third, and of basic importance,

is the question of salaries, particularly for nurses. Competent personnel cannot be persuaded to enter any profession in large numbers unless the compensation bears some relationship to the time, effort, and money expended in training. These problems are, of course, outside of the scope of the official program. They are, however, vital to its ultimate success, and we are actively interested in discovering effective solutions.

Another important technique in this program is the use of demonstrations and consultation. We have built up a staff of experts to assist the states in planning. Consultants have been placed in the Public Health Service District Offices throughout the country. They are the key people whose primary function is to interpret the program to the states and, in turn, to keep the central office informed as to the needs and problems of the states. In some instances, they are also available to help the state staff in getting its program under way. Similar assistance is needed within the states, and should be provided by the state agencies to communities.

The central element in the structure—the technique which makes possible the realization of the program—is, of course, the use of federal grants-in-aid. The principle of grants-in-aid to the states for health purposes is now well established; it has served well in such programs as those for developing general health services, control of venereal disease, and tuberculosis control, and it is now being applied to industrial hygiene, cancer control, and mental hygiene. All of these programs have in common the purpose of stimulating and assisting the development of health services by the state and communities. Enough funds are provided to make it worth while for the states to participate. The states, however, provide enough of the financial support so that they retain

the major responsibility and the ultimate control. Local responsibility is essential since the actual work must be done in the state and in the community, by people familiar with local needs and problems.

The hospital program involves grants-in-aid for two purposes—for survey and planning activities, and for construction. Three million dollars is authorized by the Act for surveys, the money to be allotted according to population. For construction, \$75,000,000 a year is authorized for a 5 year period. These funds are allocated according to a formula which gives larger amounts per capita to the lower-income states. In each case, federal funds may be used to cover only one-third of the total costs; in other words, each federal dollar must be matched by two dollars from other sources. Thus, if Congress provided the maximum amount for the 5 year period, the federal funds would amount to \$375,000,000. When fully matched by non-federal funds, the total amount available for construction would be \$1,125,000,000.

Instead of directly appropriating funds for construction, the appropriations Act for the current fiscal year sets up a new arrangement which makes \$75,000,000 available for the first year of construction. This arrangement permits the Public Health Service to enter into a contract for each approved project; this contract becomes a federal obligation, and the funds are then appropriated by Congress.

The need for health education, in the broadest sense, has been apparent throughout this discussion, and therefore should be given separate consideration as one of our fundamental techniques for developing the hospital program.

The major part of the health education program will be carried on either through the state agency or in close coöperation with it. The Washington

office works to some extent with newspapers and magazines, and develops coöperative programs with other government agencies and national organizations. But its chief concern is to assist the states and communities in developing their own programs, geared to local needs and timed for maximum effectiveness.

Health education in the hospital program has served definite objectives. First of all, it must be directed to the general public, showing them the value of hospitals and; in many cases, how to organize and plan to obtain them. State and local health departments, professional associations, civic organizations, and community leaders occupy key positions in this work.

Another purpose of health education is to persuade people to make use of hospital facilities. Many of us today forget that the tradition of the pest-house lingers on in the minds of many people. They regard the hospital as a place in which to die, and therefore to be avoided. Education and experience will be necessary to correct this. Another goal of this program is to promote planning for hospitals in rural areas where the need is greatest. And still another point concerns the general practitioner. The now critical shortage of doctors in rural areas must inevitably become still more critical unless and until facilities are provided in which they can properly carry on their practice.

Research is another of the basic techniques which must be used in a continuing program such as this. We must seek better methods of determining hospital needs. We must develop better ways of building hospitals and of operating them. We must improve our methods of training personnel. We must develop better methods of financing hospitals and health services. We must seek to integrate research activities in all phases of hospital planning

and to make this information available without delay.

Then, there is the technique of legislation. When public funds are expended and when the public welfare is affected, laws and regulations are necessary to protect the public interest. In addition to the basic Act, much state legislation has been required to permit participation in the program. Such legislation must be wisely and carefully drawn up if it is to achieve its purposes.

Coöperation with nonofficial agencies is another cardinal principle in the hospital program. In framing the basic law, Congress sought and weighed the views of organizations and individuals with wide experience in all aspects of the problems involved. In drawing up the regulations, the Surgeon General was assisted by an 8 member Federal Hospital Council, and by an advisory committee composed of 40 expert consultants. Similar advisory councils have been set up by the states themselves. Many nonofficial agencies are represented on both the national and state advisory committees.

A final technique which must be used by any group conducting a long-term program, is that of periodic review and self-evaluation. The Federal Hospital Council meets with the Surgeon General at intervals for this purpose. In the District Offices of the Service, and in the state agencies, the program will be reviewed each year before budgets and plans are submitted.

As you have seen, these techniques are somewhat arbitrarily defined. They could be further subdivided and reshuffled in various ways. Nevertheless, all of them are essential if we are to achieve our primary objective—not simply to build hospitals and health centers, but to plan, build, and organize them for maximum effectiveness in im-

proving the health of the people in every community in the nation.

As I remarked at the outset, the program is now in its second year of operation. The survey and planning phase, to which the first year was devoted, is now drawing to a close. Several preliminary applications for grants for the construction of individual projects have already been received; and complete applications, ready for final approval, will arrive very shortly. Thus, actual construction work should be under way in some areas before the end of the year.

Once the state plan is approved, the way is cleared for action. What happens from there on is primarily dependent on local initiative. Specific community needs must be studied; community support must be obtained; detailed plans must be worked out to meet local needs; and arrangements must be made to finance both the sponsor's share of construction costs and the total cost of maintenance and operation.

Now in closing I should like to emphasize that this program opens up a vast new field in public health. Both the hospital construction and licensure programs are new and greatly different from traditional public health activities. Thus, successful administration will require new concepts, new skills, and new approaches. Hospitals from their beginning have grown up in the tradition of community service and autonomy. These traditions cannot and should not be broken. Rather the official agencies must learn to work within them. Once the hospitals are convinced that government is their friend and servant and not their master, the way will be open for effective coöperation. Only through effective coöperation of all concerned can our goal of adequate health services be achieved.

# Hospital Relations

## Hospital Planning in New York State \*

JOHN J. BOURKE, M.D., M.P.H., F.A.P.H.A.

*Executive Director, New York State Joint Hospital Survey and Planning Commission, Albany, N. Y.*

THE report of the Commission on Hospital Care, *Hospital Care in the United States*,<sup>1</sup> emphasizes the fact that the hospital situation is never static. Improvements in treatment methods, development of new technical equipment and advances in medical science require continuous alertness in hospital planning. The development of an economical, effective and coordinated hospital program demands ceaseless study by the various medical, hospital and health service interests.

A group of experts on hospital care and related activities would find little difficulty in mapping out a broad and comprehensive hospital plan for an undeveloped area; however, to be realistic, any state hospital planning agency must give considerable attention to the developments which may have preceded the present planning stage, especially since such developments usually represent varying interests and aims, both altruistic and vested.

Because of the multiplicity of interested individuals, professions and groups at the state and community levels, hospital planning in New York State has been organized in a democratic manner to allow for full participation of these many interests in state, regional, and community conferences.<sup>2</sup>

### ORGANIZATION ON THE STATE LEVEL

The new Federal Hospital Survey and Construction Act recognizes the need, and requires a single state authority for hospital survey and planning purposes. Unlike a majority of the states, where the departments of health have been designated as the state authority, New York State has appointed the Joint Hospital Survey and Planning Commission, composed of the State Commissioners of Health, Social Welfare and Mental Hygiene, with a member of the Legislature, familiar with hospital administration and health problems, serving in an advisory capacity. This has seemed advisable because, in addition to the Department of Health, the Departments of Mental Hygiene and Social Welfare have considerable responsibility for the administration of services related to the hospital field.

The regularly scheduled monthly meetings of the Hospital Planning Commission have been productive and have made it possible to avoid difficulties and misunderstandings which might have arisen had the responsibility been placed in any one state department.<sup>3</sup> In addition, close working relationships have been maintained with the state post-war public works planning activities throughout the planning period.<sup>4</sup>

A State Advisory Council of 25 members, appointed by the Governor to assist the Commission, includes representatives of the hospital trustees

\* Presented before the Health Officers Section of the American Public Health Association at the Seventy-fifth Annual Meeting in Atlantic City, N. J., October 10, 1947.



and superintendents, rural and urban physicians and nurses, the medical schools, public health and public welfare officials, Blue Cross Plans, agriculture, labor, and industry. Urban and rural, public and voluntary, and religious interests are also included.

#### PLANNING ON THE REGIONAL AND LOCAL LEVEL

In 1946, the New York State Commission to Formulate a Long Range Health Program<sup>5</sup> recommended a regional approach for hospital planning in New York State, as a result of its own studies, the proposals of Mountin, Pennell, and Hoge in 1945,<sup>6</sup> studies of the Planning Committee of the Medical Society of the State of New York (1945),<sup>7</sup> conferences with the deans of medical schools, and experiences in this country and in England. The specific boundaries for the 6 provisional hospital planning regions and their subdivisions were determined on the basis of location of facilities, population distributions, marketing practices, and other factors. The regions, which include 6 to 16 counties and populations ranging from 850,000 to 1,500,000 persons, each have a focal point or primary center with at least one medical school and one teaching-type hospital. Each region is further subdivided into a primary or base area, secondary or intermediate areas, and rural areas.

Ideally, political boundaries should be disregarded in the development of such hospital service areas but, from a practical viewpoint, it was necessary to adopt county lines as boundaries of these areas for statistical and legal reasons, among others. However, county lines should not and will not influence or restrict the flow of patients seeking hospital care.

Consistent with this approach, conferences were arranged in each of the 6 regions to include representatives of the many agencies concerned with the

establishment, operation, support and use of hospitals. This brought the state-wide survey and planning for hospitals closer to the local communities and provided an opportunity for local individuals to participate in the overall development of plans.

At each of these meetings, competent people in the hospital and related fields presented their problems and viewpoints. Their subjects included an appraisal of state and local responsibilities, the aims of federal and state legislation and the opportunities for aid in financing and planning. There was discussion of the content and scope of the proposed hospital survey; of the problems of meeting hospital needs in rural areas, small cities and the primary centers; of the relationships between community hospitals and the larger urban hospitals; of the influence of Blue Cross and Blue Shield Plans on hospital service; of the role of the medical schools and teaching hospitals in a coordinated hospital program; of the relationship between hospital, public health and public welfare services; and of the opportunities of sound planning on a regional basis.

Each of the preliminary regional conferences elected a Regional Hospital Survey and Planning Council and designated a secretary, competent in hospital administration, to serve on a state-reimbursement consultant basis. It is interesting to note that the chairmen selected for 5 of the 6 Regional Councils are prominent businessmen.

These Councils, and their executive committees (established in 1946), have continued to serve in the completion of the hospital survey and in the development of the master plan for New York State.

To avoid duplication, the Hospital Council of Greater New York, which has been actively engaged in hospital planning for the City of New York since 1938, was designated as the clear-

ing house for the state work in New York City, with the state subsidizing a portion of its pay roll. Similarly, the State Hospital Commission has cooperated with the Council of Rochester Regional Hospitals which has undertaken a regional hospital plan under Commonwealth Fund auspices.

Briefly, the regional plan of organization has seemed a desirable device: (1) to provide a decentralized method of completing the hospital survey, (2) to return the survey findings to the localities, (3) to appraise existing local hospital facilities, (4) to secure regional recommendations on need for additional hospital facilities and for developing a system of priorities to guide the allocation of federal grants-in-aid, (5) to avoid expensive duplication of facilities, (6) to utilize the 4 medical teaching institutions outside New York City in improving facilities for medical, public health and nursing education, and (7) to develop a coordinated hospital plan for each region and, therefore, for the state.

#### THE STATE-WIDE SURVEY

With some modification, primarily the deletion of the financial section, the Schedule of Information, developed and recommended by the Commission on Hospital Care, was utilized in securing detailed information from all of the hospitals in New York State.

A somewhat unique procedure was adopted in securing the field data from the individual hospitals. A competent hospital administrator, selected from the primary and each of the intermediate hospital service areas of each region, met with the individual hospital superintendents within his service area to facilitate the completion of the inventory schedule. Subsequently, each of these representatives reviewed his completed schedules with the secretary of his regional council so that the latter might ascertain the accuracy of the

reports and be informed as to the structural organization and service details of each of the hospitals in his region. The schedules were then edited and reconciled with existing state records by the Hospital Planning Commission and sent to the American Hospital Association for coding, punch card preparation and preliminary tabulations.

By having local individuals participate in the fact gathering, the executive committees of the various regional councils were better able to classify their facilities as suitable or unsuitable and to make recommendations for new hospitals, expansion of existing hospitals, and replacement of obsolete plants.

#### PLANNING STAGE

The staff of the State Hospital Planning Commission assembled, with the help of the several departments concerned, information covering vital statistics, social, economic and other factors for each of the hospital service areas. These data were then made available to each of the regional councils to guide them in the development of local plans.

Utilizing the birth-death ratio formula,<sup>8</sup> it was possible to estimate the general hospital beds needed to accommodate peak loads. However, it was not possible to develop a formula for the allocation of general hospital beds from rural and intermediate areas to the primary and secondary hospital centers. Therefore, in determining allocations, the factors considered were those of residence of patients treated at the individual hospitals, as reported in the hospital survey, together with social, educational, and economic data which might have an effect upon the establishment and growth of hospitals. With this information before them, the regional councils then discussed and revised the estimates prepared by the state agency.

Caution was exercised in appraising hospitals as to suitability or unsuitability for long-range planning. Conferences of the staff of the Hospital Planning Commission, the area directors and hospital inspectors of the State Department of Social Welfare, and the regional secretaries made preliminary appraisals. In these evaluations all existing hospitals, or portions thereof, were considered unsuitable if they presented definite fire hazards, were obsolete structures or were housed in non-fire-resistive converted dwellings. In certain instances, hospitals were classified as unsuitable because of their very small size which made them uneconomical to operate and difficult to staff. However, in some instances where these smaller hospitals were of sound construction, it was recommended that they expand to at least 50 beds. These appraisals of acceptability were then reviewed by the executive committees of the respective regional councils.

Keeping in mind the locally planned hospital projects, the regional councils formulated recommendations for the state agency as to the size and, in some instances, the location of new hospitals, the expansion of certain hospitals, and the replacement of all or part of obsolete and small plants.

In addition, the regional executive committees adopted resolutions embodying a number of broad principles for regional and state-wide planning, such as:

1. That, except in rare, isolated geographical situations, the minimum size for rural and small urban community general hospitals should be set at 50 beds. The minimum size for new general hospitals in the primary centers should be 150 beds, and in the secondary centers 100 beds.

2. That plans should provide for closer working relationships between full-time public health departments and general hospitals and, where possible and desirable, arrangements should be made for housing health departments in or adjacent to general hospitals.

3. That formal working relationships or affiliations between rural and small urban hospitals and the secondary hospital centers and primary teaching-type hospitals are recognized as desirable for the provision of special diagnostic, consultative, and treatment services, where needed, and for the encouragement of medical and nursing education programs.

4. That chronic disease hospital facilities should be provided as an integral part or wing of general hospitals.

5. That specialty hospitals, such as eye, ear, nose and throat hospitals, should not be developed independently but should be encouraged as a service of the general hospital and not established as separate small units.

The regional councils generally agreed that these principles should be considered in the allocation of state and federal funds and that, in developing project priorities for federal grants-in-aid, consideration should be given to the degree of local need, degree of occupancy of existing hospitals, and the type and quality of community service to be rendered.

The eventual master hospital plan for the state will be reviewed and revised by the Regional and State Advisory Councils before final adoption by the State Hospital Planning Commission.

The local appraisals of existing hospitals and recommendations for additional facilities made by the regional councils could not have been attempted and promulgated satisfactorily by a central state agency alone—nor would it have been practical or expedient to do so.

During the coming months, the local communities which are planning hospitals and related projects will have competent and understanding assistance from the regional councils. Many local problems will arise. They should be solved so as best to meet the need of the area. They should be resolved so as to coordinate community initiative and resources and to insure high quality of care and accessibility, at the lowest

cost compatible with the service to be rendered.

#### RURAL HOSPITAL AND HEALTH PLANNING

Local interest in more adequate rural hospital and health services has increased considerably during the past year and a half in New York State. It has been stimulated by the Governor's program of liberalization for state aid to counties for the establishment of county health departments and by the possibilities of federal grants-in-aid and state aid for construction of hospitals, health centers and related facilities. This interest has been further stimulated by the Regional Hospital Survey and Planning Conferences and by regional farm meetings sponsored by the State Extension Service and farm organizations during 1946, in which the Joint Hospital Survey and Planning Commission and the State Department of Health participated.

As a result of this local interest in rural health and hospital planning, the New York State Department of Health has established a joint committee with the State Hospital Planning Commission for the development of comprehensive hospital and public health services for rural counties. Counties of less than 50,000 population may apply for state aid of 50 per cent of local expenditures toward capital costs of county general hospitals and health centers, and 50 per cent toward the annual operating deficit of such hospitals. Furthermore, since the Federal Hospital Survey and Construction Act will make funds available for one-third of the construction costs of approved projects, and state aid funds absorb half the remaining cost, or one-third of the total, it is possible for rural counties to establish a county state-aided hospital by raising only one-third of the total cost from local sources. This presents an excellent opportunity for

coördinating the services of the hospital, the county laboratory, and the county department of health.

To date, 13 rural counties have requested that surveys be made and plans suggested by the state for the development of comprehensive health and hospital services in their respective areas. In each instance the formal request must emanate from the county board of supervisors. It has been further recommended that similar resolutions be received from the county medical society and other interested groups.

#### CHRONIC DISEASE CARE

With the aging of our population, it is becoming increasingly important to prevent and lessen the physical, psychological, social, and economic ravages of chronic illness; and, with the many recent and dramatic demonstrations of the potentialities of rehabilitation, this task can well be one of hope, not the despair of the past. Yet, throughout the nation, as in New York State, there is a growing realization that the present facilities for the care of the chronically ill are inadequate.

To alleviate this situation, the Hospital Planning Commission intends to implement the comprehensive program for improving the care of the chronically ill in the state which was recommended to the State Legislature earlier this year (1947) by the New York State Commission to Formulate a Long Range Health Program.<sup>9</sup> The major proposals inherent in this program are:

1. The provision of a state agency to carry out a program for the care of chronic illness, exclusive of tuberculosis and mental disease.
2. The establishment of a chronic disease hospital center in each hospital region of the state, providing diagnostic, treatment, teaching and research facilities, to serve as a referral and consultation center. Whenever feasible, the center should operate in conjunction with a general hospital and a medical school.
3. The bulk of the hospital care for the

chronically ill should be provided in wings, wards or floors of general hospitals or in contiguous buildings. Such general hospitals should have formal affiliation with the regional chronic disease hospital centers.

4. All medical *and related* institutions caring for the chronically ill should be required to meet minimum standards of facilities and care formulated and published by the state.

5. The expense of care and rehabilitation of chronically ill persons unable to pay therefor in general hospitals *and related* institutions should be shared by the state.

6. Services for the care of the chronically ill in their homes should be expanded by providing home bedside nursing care and house-keeping aides.

#### MENTAL DISEASE CARE

The scope of the planning for the care of the mentally ill in New York State is illustrated by the fact that improvements and expansion of the state mental hospitals, as part of the State Post-war Public Works Planning Program, will aggregate over \$96,000,000, including the construction of central medical and surgical units at the larger hospitals. These units will make possible complete physical and psychiatric studies of newly admitted patients as a basis for screening, classification, scientifically determining their prognoses and assessing their potentialities for rehabilitation. In addition, there is considerable state-wide interest in developing psychiatric units at voluntary general hospitals for short-term care and study.

#### TUBERCULOSIS HOSPITAL PLANNING

With the exception of the metropolitan New York City and Buffalo areas, the problem of needed tuberculosis beds is one of redistribution of facilities rather than of new construction. It is believed that this inadequacy can be overcome readily through the new state aid available to local tuberculosis hospitals, especially because of the new and competent state committee on tubercu-

losis which is making a detailed evaluation of all tuberculosis hospital facilities.

#### HEALTH CENTERS

Perhaps the most pertinent development in health center planning in New York State, and one that has met with wide acceptance in the rural areas, has been the recommendation that space for a health center facility to house the full-time county health department should be provided in each of the county state-aided hospitals planned for rural areas. It should be noted that, because of the geographic characteristics of New York State, the Commission does not generally recommend the establishment of small community health centers with treatment facilities, except in a few isolated areas, and even in these it advocates that the centers be affiliated with larger general hospitals.

With the provision of state aid to cities of 50,000 population or over for full-time health departments, there will undoubtedly be increasing interest in the development of health centers to house these urban departments. This will require considerable study by the State Department of Health and the Hospital Planning Commission. Unfortunately, however, the full development of this latter program will probably be delayed because of the need to utilize initial federal funds to relieve the acute shortage of general hospital beds.

#### AN INTEGRATED HOSPITAL PLAN

The American Medical Association, in coöperation with the U. S. Public Health Service, has taken a forward and constructive step toward furthering the development of a coördinated hospital system in preparing a short, comprehensive, yet concise pamphlet entitled *Extension of Medical Care Means Better Health for All Americans*<sup>10</sup> for distribution to all physicians. It presents the mechanism by which a co-ordinated hospital system might work

and what it means to the doctor. It points out the two basic principles involved in a coördinated hospital plan based on adequate facilities, namely: (1) "the flow of professional personnel and special services from the large hospital to the small hospital," and (2) "the flow of patients, specimens and records from the small to the large institutions."

Such a system would consist of four types of units—the medical center, the district hospitals, the community hospitals and, in rural and isolated sections, the community clinics. The core of the system, the medical center, would be a hospital connected with a medical school and would have complete teaching, research, diagnostic and treatment facilities. The encircling district hospitals, of 100 to 200 beds, would similarly have well organized services in most of the specialties but not complete teaching and research facilities. The smaller community hospitals, of 50 to 100 beds, would look to the district hospitals for consultation service and, when necessary, would refer patients to them. The community clinic would be a consultation center, with beds only for emergency cases. In addition, it is suggested that public health offices be housed in the hospitals proper, thus integrating preventive and curative medicine more closely.

It cannot be stressed too emphatically that such a coördinated hospital system will be invaluable to all practising physicians, especially those in rural areas and smaller cities. They would benefit from the research and postgraduate contacts at the medical center and the availability of consultation services. Their patients, therefore, would be more likely to patronize local hospitals rather than migrate to the larger, more distant ones, as is now often the case.

This is the approach that has been taken in New York State, whose master plan is being developed by the many

individuals and agencies, both public and private, interested in the problem. It should serve as a flexible guide to local communities in developing better hospital and health services.

However, the task is not only one of construction of facilities. There are immediate problems and others, now unforeseen, are sure to arise. For example, the planning for general hospitals has raised fiscal problems requiring study and conferences, especially because of their increasing operating and per diem patient-day costs. In addition, increasing attention must be given to the establishment of hospital standards and the procurement and supervision of medical, nursing, and other personnel.

The speed with which the aims of the master plan are accomplished will depend on the interest and zeal of the public, the full support and coöperation of the medical profession and hospital authorities and their willingness to work harmoniously with voluntary and governmental agencies. The program is being planned with full appreciation of local needs. Flexibility in planning has been a prominent feature. The results should, therefore, be most acceptable to our co-planners and users of the envisaged facilities—the local citizens.

#### REFERENCES

1. Commission on Hospital Care. *Hospital Care in the United States*, The Commonwealth Fund, New York, 1947.
2. Joint Hospital Board of the New York State Postwar Public Works Planning Commission. *New York State Plan for Survey of Hospital Facilities and Program for Regional Hospital Planning for Postwar Hospital Construction*, 1946.
3. State of New York. *Laws of 1947*, Chapter 578, Section 6.
4. New York State Postwar Public Works Planning Commission. *Final Report*, Legislative Document (1947) No. 68, Mar. 31, 1947.
5. New York State Temporary Legislative Commission to Formulate a Long Range Health Program (New York State Health Preparedness Commission). *Planning for the Care of the Chronically Ill in New York State—Regional Aspects*, Legislative Document (1945) No. 78-A.
6. Mountin, Joseph W., Pennell, Elliott H., and Hoge, Vane M. *Health Service Areas*, (*Public Health Bulletin No. 292*), Federal Security Agency, U. S. Public Health Service, Washington, 1945.

7. Planning Committee for Medical Policies of the Medical Society of the State of New York. *Minutes of the House of Delegates of the Medical Society of the State of New York*, Oct., 1945, p. 57.

8. Commission on Hospital Care. *op. cit.*, pp. 290-301.

9. New York State Temporary Legislative Commission to Formulate a Long Range Health Program

(New York State Health Preparedness Commission). *A Program for the Care of the Chronically Ill in New York State*, Legislative Document (1947), No. 69.

10. U. S. Public Health Service, Hospital Facilities Section (prepared for distribution by the American Medical Association). *Extension of Medical Care Means Better Health for All Americans*, Chicago, 1947.

---

## Finland Needs Technical Books

Arthur E. Morgan of the American Friends Service Committee makes the following plea in behalf of the Helsinki Institute of Technology.

During the war, Finland's excellent and keenly scientific minded Technical Institute (Teknillinen Korkeakoulu) was bombed and totally destroyed. On a recent trip to Finland for the American Friends Service Committee, Dr. Martti Levon, Director of the Institute, said he would welcome gifts of scientific and technical books and periodicals from America. The lack of technical

library facilities is a very serious handicap in the Finns' remarkable efforts for recovery.

It would be a practical act of friendship to a nation that holds America in high regard if Americans should contribute good technical books and periodicals to this library. Such gifts should be marked for the Institute of Technology, Helsinki, and sent to the Legation of Finland, 2144 Wyoming Avenue, N.E., Washington, D. C. The Finnish Minister, Dr. K. T. Jutila, will arrange for shipments to Finland.

# Hospital Relations

The Hospital Planning and Licensing Programs in Indiana \*

L. E. BURNEY, M.D., F.A.P.H.A., AND  
MARTHA O'MALLEY, M.D., F.A.P.H.A.

*State Health Commissioner, Indiana State Board of Health; and Director of the  
Division of Hospital and Institutional Services, Indiana State Board of  
Health, Indianapolis, Ind.*

HOSPITAL survey, planning, inspection, and licensing constitute new fields of endeavor for most health departments. Two acts passed by the 1945 Indiana General Assembly<sup>1,2</sup> referable to the above functions enabled the Indiana State Board of Health to develop hospital planning and licensing programs in advance of many other states. We believe that the methods used, the problems encountered, and the results to date may be of interest and possibly of some assistance to other agencies which have assumed similar functions.

We realized from the beginning that both the hospital planning and the licensing programs would bring the State Board of Health into a new relationship with professional groups, particularly hospital administrators, physicians, dentists, and nurses. Therefore, the advice and assistance of such groups were sought and secured in the organization and development of these programs. The members of these associations have been kept thoroughly informed on the developments of the programs in the various stages.

One of the first steps taken preparatory to the survey of hospitals and health centers was to meet with the representa-

tives of the hospital, medical, dental, and nursing associations. At this meeting it was recommended that six regional meetings be held and that members and officials of the organizations concerned attend. These meetings served to acquaint such individuals with the purpose and scope of the survey and afforded an opportunity to discuss the survey form prepared by the Commission on Hospital Care entitled "Schedules of Information." The survey form was mailed to all hospitals and related institutions during September, 1945, and the completed forms were received by March 1, 1946. As was to be expected, our staff members made many field trips in connection with the completion of the survey forms. These were reviewed before being sent to the Commission on Hospital Care for tabulation.

Following the tabulation of the completed schedules, a tentative hospital plan, based on the formulae proposed by the Commission on Hospital Care, was developed with the assistance of an Advisory Hospital and Health Center Planning Council. This Council was appointed by the Governor to work with the State Board of Health in the development of the state hospital plan. The membership of this council is composed of the following:

State Health Commissioner, Chairman	1
Representing the Indiana State Medical Association	3

\* Presented before the Health Officers Section of the American Public Health Association at the Seventy-fifth Annual Meeting in Atlantic City, N. J., October 10, 1947.



Representing the Indiana State Nurses' Association	1
Representing the Indiana Hospital Association	2
Representing the Indiana State Dental Association	1
Representing the Indiana Pharmaceutical Association	1
Representing Consumer Groups	
Agriculture	1
Labor	1
Industry	1
Representing the Indiana Society of Architects, A.I.A.	1
Federal Advisory Hospital Committee (Indiana members)	2
Director of the Indiana Economic Council	1
Director of the Indiana Department of Public Welfare	1
Total.....	17

The development of a tentative state hospital and health center plan enabled the council and the State Board of Health to work out the principles to be followed in preparing the final plan. When the federal regulations<sup>3</sup> were received early this year, we adapted our previously developed tentative hospital plan to these regulations. The federal regulations required only minimum standards, thus allowing us flexibility in planning to meet the particular needs of our state. Figure 1 shows in a diagrammatic manner Indiana's proposed coordinated hospital plan.

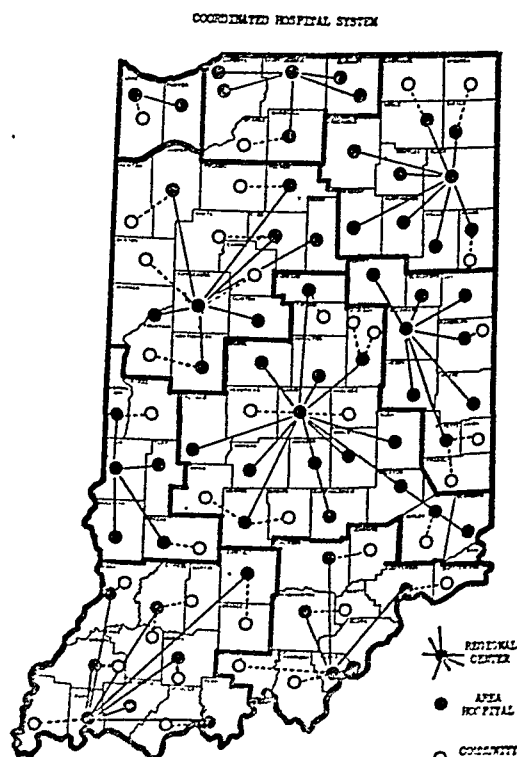
The principles followed in the development of our State Hospital plan<sup>4</sup> were as follows:

1. The development of a coordinated hospital system on a voluntary basis.
  - a. The base hospital shall include a teaching hospital of a medical school approved by the American Medical Association's Council on Medical Education and Hospitals. This requirement will provide quality services in the various medical specialties and will make available consultation service and postgraduate educational programs for professional personnel in district and rural hospitals. (There is only one center in Indiana—the Indiana University Medical Center in Indianapolis—which meets these re-

quirements. Fortunately, it is located in the center of the state.)

- b. Intermediate hospital areas shall include hospitals that meet requirements equivalent to those established by the American College of Surgeons or the Council on Medical Education and Hospitals of the American Medical Association. They shall maintain high quality facilities and personnel for providing specialized services in the fields of internal medicine, surgery, obstetrics, pediatrics, ear nose and throat, dentistry, radiology, and laboratory, and shall provide training courses for interns or residents. In addition, plans will be made to offer, in the future, specialized services in venereal diseases, tuberculosis, communicable diseases, and psychiatry. The base hospital will provide postgraduate educational opportunities for professional personnel in the area.
  - c. Hospital service areas will be allotted for all existing and proposed hospital facilities of 25 or more beds. This number was chosen because it is conceivable that a facility of 25 beds would increase to a 50 bed hospital.
2. Plan for allotment of hospital beds in the various categories.

FIGURE 1



- a. General hospital beds are allotted on the basis of the federal regulations and the formulae proposed by the Commission on Hospital Care. This, in Indiana, provides approximately 5 beds per 1,000 in the base area, 4.5 in intermediate areas, and 3 per 1,000 in local or rural hospital areas. Community clinics or health centers are planned within a larger hospital service area, with a provision for 1 bed per 1,000 population.

b. The 2 chronic disease beds per 1,000 population are allotted as follows: 1.5 beds per 1,000 population to be constructed as units of local (rural) general hospitals, and the remaining beds—amounting to over 2 per 1,000 population—to be constructed in intermediate
- and base areas as units of general hospitals.

c. One-third of the total mental beds are planned as units of intermediate and base general hospitals, and the other two-thirds are planned in connection with state mental hospitals.

d. Tuberculosis as well as mental units are to be established in connection with intermediate and base general hospitals. All additional tuberculosis beds are planned as units of intermediate and base hospitals. The only new beds to be allocated in county and state tuberculosis hospitals are for replacements of nonacceptable beds. General hospitals, other than those in the intermediate and base areas, are to be permitted to plan

FIGURE 2  
List of Areas in Priority 'A' Group

Area No.	County	Hospital Community Area Center	Area Priority No. "A"	% of Need Met	Miles to General Hospital	Area Rank* Financial Need
R-21	Perry.....	Tell City.....	1	0	46-50	84
R-27	Washington.....	Salem.....	2	0	30-35	85
R-57	Scott Lagrange.....	Lagrange.....	3	0	"	67
R-80	Starke.....	Knox.....	4	0	20-25	75
R- 8	Hendricks.....	Danville.....	5	0	"	68
R-47	Pulaski.....	Winamac.....	6	0	"	59
R- 2	Tipton.....	Tipton.....	7	0	"	43
R- 9	Hancock.....	Greensfield.....	8	0	"	37
R-42	Fountain.....	Veedsburg.....	9	0	"	34
R-14	Warren Rush.....	Williamsport..... Rushville.....	10	0	"	22
R-54	Whitley.....	Columbia City.....	11	0	"	29
R-20	Warrick.....	Boonville.....	12	0	15-19	21
R-10	Spencer Owen.....	Spencer.....	13	0	"	70
R-19	Dearborn Ohio.....	Lawrenceburg.....	14	0	"	45
R-46	Jasper.....	Rensselaer.....	15	0 <sup>1</sup>		55
R-37	Newton Randolph.....	Winchester.....	16	0 <sup>1</sup>		27
R- 4	Hamilton.....	Noblesville.....	17	0 <sup>1</sup>		42
R-24	Knox.....	Vincennes.....	18	0 <sup>1</sup>		34
R-22	Dubois.....	Jasper.....	19	Less than 25%		77
R-21	Greene.....	Linton.....	20			59
I- 2	Floyd.....	New Albany.....	21			55
	Clark Crawford Harrison					
R-55	Noble.....	Kendallville.....	22	"		22
I- 1	Vanderburgh.....	Evansville.....	23	"		2
	Posey					

\* Ranks are arranged in inverse order. Areas needing financial assistance must have the highest numerical rank.

<sup>1</sup> County has non-conforming general hospital. These four counties are arranged in order of relative need considering existing facilities.

Cities and towns listed under this heading are the name by which the area will be known. Several hospitals and health centers may be located in each area designated.

tuberculosis and mental units, provided trained medical, nursing, and other professional personnel are available to staff them.

- e. Public health centers with administrative offices for public health personnel are provided. These administrative units will be developed wherever possible in connection with hospitals or health centers. Where this is not possible, separate facilities may be planned.
- f. The priority for federal grants-in-aid for hospital construction<sup>5</sup> was established for every hospital service area in the state on the basis of relative need for hospital services. A second factor to be introduced to differentiate the relative need of areas that do not have any existing hospitals was the distance from neighboring general hospitals of 50 or more beds. A third factor used to separate areas where the relative need was practically the same was the area's effective buying power in relation to that of the state. (See Figure 2 on "A" priority group.)

Indiana's hospital and health center plan, incorporating the above principles, was approved by the planning council and by the State Board of Health early in May, 1947. The plan was then presented to the executive committee of the Indiana Medical Association, to a joint meeting of the licensing council and the Indiana Hospital Association, and to the Indiana Nurses' Association. It was approved in principle by these groups. In addition, the plan was presented to the State and Component Officers of the State Dental Association, to the Indiana Public Health Association, and to the Indiana Economic Council. A description of the plan was published in approximately four hundred newspapers throughout the state. A public hearing on the plan was held on June 9, 1947. There was no expressed opposition from either the professional or the lay groups. The Surgeon General of the U. S. Public Health Service approved our plan in July.

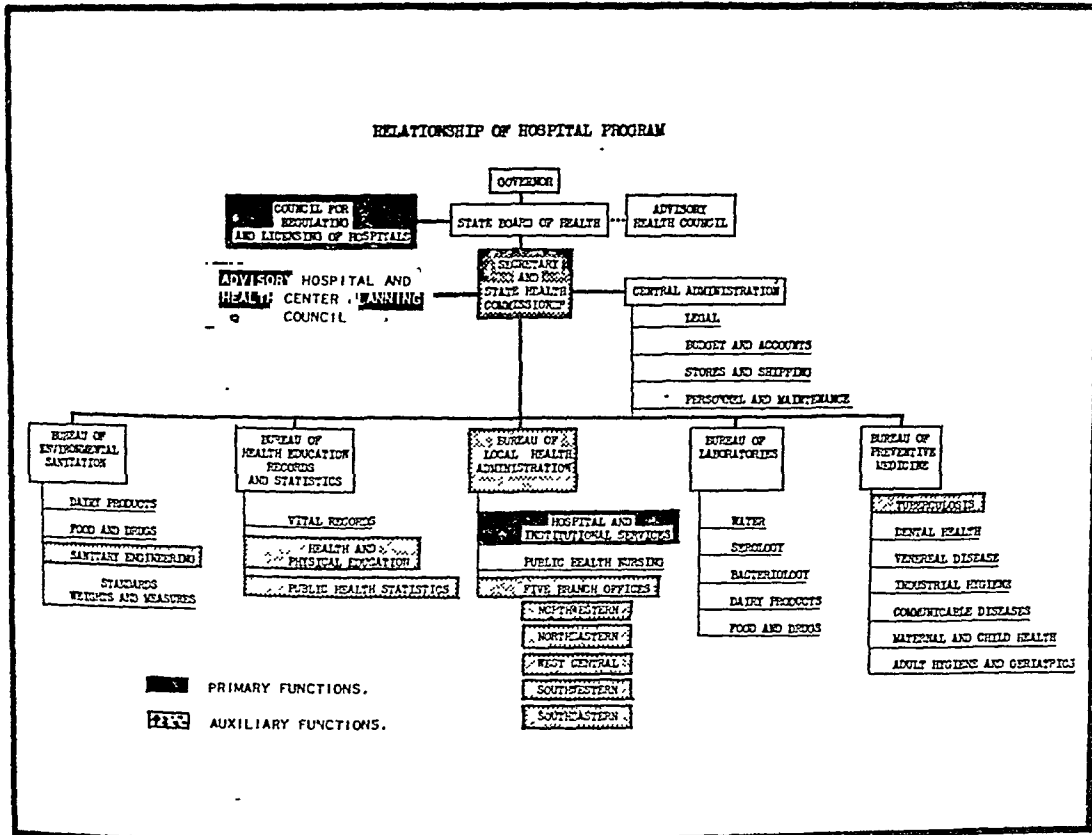
Indiana's 1947 General Assembly enacted legislation<sup>6</sup> authorizing the State Board of Health to cooperate with

the Government of the United States in the construction or improvement of public and other nonprofit hospitals and to accept and disburse federal funds to carry out this work. Therefore the hospital construction and the planning programs come under the administrative direction and supervision of the State Board of Health. The Division of Hospital and Institutional Services, which was created June 1, 1946, is responsible for administering the hospital and health center plan, resurveying hospitals and health centers, and for developing, in cooperation with the licensing council, the hospital licensing and regulating program.

The Bureau of Sanitary Engineering is responsible for supervising the construction part of the hospital program, for making site surveys, and for the inspection of hospitals in regard to compliance with the environmental sanitation clauses of the general regulations for hospitals.<sup>7</sup> In addition, personnel from the Division of Health Education and the branch offices of the State Board of Health are participating in promoting the educational aspects of the program. Realizing that an extensive educational program is required to disseminate information and to bring concerted effort to bear on local problems, a workshop conference for health education personnel was held in June of this year. Figure 3 presents the functional organization of the State Board of Health, showing the relationship of the various activities in the hospital program.

The Division of Health Education and the branch offices of the State Board of Health, working with the Division of Hospital and Institutional Services, have disseminated to local areas information in regard to the state hospital and health center plan. They have encouraged local communities to study their public health and hospital problems in order to effect an organization to meet their needs. Our health educators

FIGURE 3



are working with local hospital boards in developing and carrying out educational programs to acquaint the public with the services offered by hospitals and the interrelationship of hospitals and public health programs. Rural medical care committees throughout the state are vitally interested in planning adequate hospital facilities for people in the rural areas.

It is believed that the hospital and health center plan can be promoted through the hospital licensing program. As required under the Federal Survey and Construction Program, an annual survey of the hospital facilities will be made at the time of the annual inspection of the hospitals for licensure.

An act passed by the 1945 General Assembly provides that the regulating and licensing of hospitals shall be administered by the State Board of Health with the assistance of a council. This council consists of 4 hospital admin-

istrators, 1 physician, 1 nurse, a member of the State Department of Public Welfare, and a member of the State Board of Health. The membership, the term of office, and the functions of the council are specified in the licensing act. This is in contrast with the planning council which is appointed by an Executive Order. The licensing council has no direct responsibility for the state hospital and health center plan. Only one person, the Director of the Department of Public Welfare, is a member of both councils. No difficulty has been encountered in having separate councils carrying out the planning and licensing phases of the hospital programs. Since we have relied so heavily upon both groups, this arrangement has proved to be very advantageous. It would have been difficult for one group to have assumed dual responsibilities; also, wider representation in the health field is achieved by this method.

Upon review and approval of the council, licenses are issued by the State Board of Health. If, after investigation and a hearing, the council finds that a license should not be granted, the applicant is so notified. The decision of the council on this matter is final.

The general regulations for hospitals, promulgated under the hospital licensing act, became effective May 3, 1946. There are 41 specific regulations under the four general headings of administration, building and construction, environmental sanitation, and specialized hospitals and specialized services.

Inspections or surveys of hospitals are made by a physician, a hospital consultant nurse, and a sanitary engineer. All hospitals are also studied by the fire marshal. In addition, consultation services are provided to hospitals in general administration, business administration, nutrition, pharmacy, and statistics. It has not been possible, due to the limited staff, to inspect all hospitals prior to the issuing of licenses. Detailed inspection of hospitals under 25 beds have been made.

Following the study of hospitals, complete reports of findings—including the degree of compliance with regulations—are made to the council. The hospital administrator is invited to meet with the council when there is a question of compliance with the regulations. The administrator is informed before the scheduled meeting in regard to any regulations with which he has not complied. He is further advised that the council will wish to know his plans for compliance with the regulations before taking action on his application for a license to operate a hospital.

Administrators and owners of institutions are pleased with the opportunity to appear before the licensing council to express their viewpoints. To date, the action of the licensing council has not been contested in the application of the licensing act.

In hospitals of over 25 beds, meetings are arranged between the hospital staff and our consultants. These meetings are held after the inspection of the hospitals for the following reasons:

1. To discuss any noncompliance with the general regulations for hospitals.
2. To work out jointly plans for compliance with the regulations.
3. To discuss the application of the provisions of the state hospital and health center plan to the individual hospital.
4. To answer any questions that members of the hospital staffs may have in regard to the licensing or hospital construction program.

Those of us who have been working with the hospital planning and licensing programs in Indiana feel that they have definite possibilities for improving public health as well as hospital facilities in Indiana communities. We expect to see an increase in the practice of preventive medicine in Indiana in the next few years through the provision of diagnostic and consultation units in hospitals for the care of ambulatory patients. We believe that the working relationship established between our staff and the personnel engaged in hospital administration will result in more effective public health and hospital programs.

In conclusion, it is our belief that hospital planning and licensing programs are proper functions of a health agency. The administration of such activities has proved to be a healthy, stimulating experience in Indiana.

#### REFERENCES

1. Hospital Survey Act, Chapter 101, Acts of the Indiana General Assembly, 1945.
2. Hospital Licensing and Regulating Act, Chapter 346, Acts of the Indiana General Assembly, 1945.
3. Regulations under Section 622 of Federal Hospital Survey and Construction Act, Federal Security Agency, U. S. Public Health Service, 1946.
4. Indiana Hospital and Health Center Plan, Indiana State Board of Health, 1947.
5. Hospital Survey and Construction Act, Public Law 725, 79th Congress, U. S. Government Printing Office.
6. Hospital Survey and Construction Act, Chapter 173, Acts of the Indiana General Assembly, 1947.
7. General Regulations for Hospitals, Indiana State Board of Health, 1946.

# Hospital Relations

## Hospital Services in Saskatchewan \*

FREDERICK D. MOTT, M.D., F.A.P.H.A.

*Chairman, Saskatchewan Health Services Planning Commission,  
Regina, Saskatchewan, Canada*

ONE of the great problems in hospital planning has always been that of providing services in areas where people are unable to maintain hospitals. We have gone a long way toward overcoming this difficulty in Saskatchewan, where facilities are being planned and developed as part of a general health program, which includes compulsory hospital care insurance for virtually the whole population.

Through spreading costs, such a system not only means that care is provided on the basis of individual need, rather than capacity to pay, but it also means that hospitals can be located where they are needed, because there is payment for every case and because the cost of maintaining a particular hospital does not rest solely on the people whom it serves.

Many contend that health insurance should await great expansion of hospital facilities and greatly increased numbers of health workers. In Saskatchewan, the existence of a prepayment plan facilitates hospital development, while the work of the planning agency, through which control over the quality of services is exercised, assures emphasis on standards of care, and prevents the insurance plan from becoming a payment agency unrelated to broader health objectives.

The province in which we are working

out this coördinated program is typically rural, with a comparatively small number of people, most of whom live on farms and in little communities scattered over a vast area. The whole province of Saskatchewan is almost as large as Texas, but most of the people live in the southern half of the province, in an area as large as New Jersey, New York, and all the New England states combined. This southern part of Saskatchewan, which has a population density of less than seven persons per square mile, is for the most part wheat-growing and ranching country, essentially similar to the Great Plains states.

Eighty per cent of our 840,000 people live in communities of less than 2,500. Only two states, North Dakota and Mississippi, are more rural. There are only four centers in the province with more than 10,000 people; our largest city has a population of 60,000.

In this rural situation, fundamental social and economic factors, in combination with the character of local government, have had marked effect on the development of health services.

There is only one level of local government in the province, the municipal level, county organization never having developed in Western Canada. In addition to the cities, towns, and villages, which are organized separately, the farming districts are divided into more than 300 self-governing rural municipalities. These are typically 18 miles square, following a geometric pattern laid down by early surveyors, and

\* Presented before the Health Officers Section of the American Public Health Association at the Seventy-fifth Annual Meeting in Atlantic City, N. J., October 10, 1947.

ordinarily having populations of from 1,500 to 2,000.

For a generation, the municipal unit has been fundamental, not only in the organization of basic public health services, but in collective provision for medical and hospital care. An illustration of this is the well known "municipal doctor" plan, a system of prepayment on a municipal basis which has extended medical care to rural areas where it would otherwise have been unobtainable. Under this tax-supported system, service is ordinarily provided to all residents by a general practitioner on salary.

Experience in solving their immediate medical care problems through direct action of this kind has been highly significant in creating among our rural people not only an awareness of their medical care needs but a demand that broad solutions be worked out by government as rapidly as possible.

Less well known than the "municipal doctor" plan, but equally important in the development of provincial services, is the Union Hospital system. Union Hospital Districts are groups of municipalities—towns, villages, and rural municipalities—which have joined together to establish a special local authority for the purpose of erecting and maintaining a hospital. During thirty years of development, the Union Hospital has become the predominant type of hospital in the province. In the larger towns and cities, there are municipally owned hospitals serving the whole community.

Half of the people in the province tax themselves to provide hospital facilities. Until the beginning of this year, when the provincial hospitalization plan went into effect, many areas also made provision for hospital care for their residents.

The present organization for the administration of health services in the province incorporates within its struc-

ture provision for further development of many of the services previously established by local communities.

The provincial health program is administered by two agencies of government, the Department of Public Health and the Health Services Planning Commission, the directors of which are both responsible to the Minister of Public Health.

The Department of Public Health is responsible for developing and administering a range of public health services similar to those falling within the jurisdiction of state departments of health. In addition, the entire program of mental health is administered by the department, including institutional care. Worthy of special note among the functions of the Department of Public Health are the activities in the field of cancer control. Provision has been made for case finding and treatment at public expense. Moreover, the department conducts an air ambulance service which has demonstrated its value in making the best medical care available to persons in isolated areas.

The Health Services Planning Commission is responsible for the planning and development of health facilities and medical care services. This includes the elaboration of a provincial plan for the development of hospital facilities and the administration of laws and regulations governing hospital standards; the administration of the province-wide tax-supported program of hospital services; supervision of development of medical care services administered by health regions and municipalities; and administration of medical care for groups receiving public assistance.

We have found that the close co-ordination of functions of both the department and the commission is essential in the development of services and facilities. An important point of coördination is the health region, the local jurisdiction established for the

development of both preventive and therapeutic services.

In defining areas to be covered by health regions, as well as in planning the development of hospital facilities, common use is being made of the natural trading area. A thorough study of the province, the distribution of its population, communications, and natural boundaries, has resulted in a clearly defined picture of the distribution of trading areas and trading centers. These centers are being chosen as sites for hospital and diagnostic facilities, as well as centers for the development of preventive functions, to assure accessibility to all residents of the area. The hospital district and the public health district will thus have common boundaries.

A health region is composed of a number of these districts grouped with reference to major trading centers. Specialist services, a more extensive range of diagnostic facilities, and the organization for the administration of preventive services in the region, are being located at the regional centers.

Working closely with the health officer in each region is a regional board, which serves as the board of health and also as the board of directors for any regional program of medical care which may be developed. The regional boards are elected on the basis of population by district health councils which consist of representatives from all municipalities in the area.

Coördination of the functions of our commission and the Department of Public Health in health region development is effected by use of a common Division of Regional Health Services. This division is responsible both for public health and medical care developments in the regions. There is already evidence of the value of such coördination. District activities in the various phases of the preventive program are being based on district hospital centers wherever possible, with health center

facilities being incorporated in hospitals or developed in close relationship to them. Moreover, to an increasing extent, physicians' offices are being provided in district as well as outpost hospitals. We think that district hospitals can provide a base for supplying local practitioners with facilities and equipment essential to the modern practice of medicine, that regional centers should provide specialist and consultant services to the local doctors through development of group practice units, and that these regional groups in turn should depend for consultation and the opportunity for referral upon our two larger urban medical centers.

In our second largest city, Saskatoon, construction is starting on a 550 bed University Hospital. It is to be associated with the College of Medicine, which is being extended from a basic science course to a full 4 year course. Our whole pattern of regionalization of hospitals and health services is being built around the concept of a central teaching institution which in countless ways will raise standards throughout the province.

The principle of an integrated system has been fundamental to our thinking as we have attempted to guide hospital construction.

There are 4,286 beds in non-federal general hospitals in Saskatchewan, or almost 5 beds per 1,000 population. Because our population is widely scattered, a large number of small institutions have developed, and it will probably continue to be necessary for us to have good facilities in a few institutions with less than, say, 25 beds. Some of these, as now, will come within the category of maternity homes, or "doctors' workshops."

While there are many small institutions today, their total bed capacity is not great. If we eliminate our institutions with fewer than 15 beds, we still have 3,771 beds or 4.5 per 1,000 population. Distribution across the province



is somewhat uneven, but the lowest ratio in any region is 3.5 beds per 1,000.

Most of these institutions are administered by public authorities. The idea of municipal governments providing hospitals only for the indigent has never had the same acceptance in Canada as in the United States and Great Britain. All of our Saskatchewan hospitals serve the general population. The importance of public administration of hospitals varies in different parts of Canada: in the West it is the basic pattern, in Saskatchewan it is most important of all.

Out of 66 hospitals with 15 beds or more, 37 are administered by union hospital boards, 8 by other municipal authorities, 16 by religious orders, and only 5 by lay voluntary boards. With the encouragement of the Health Services Planning Commission, there has been a sharp increase in the population coverage and area served by union hospitals. The number of such hospitals has more than doubled during the past two years.

The combination of union hospital development, provincial grants and loans for hospital construction for the past three years, and the general demand for additional facilities, has resulted in a substantial increase in hospital accommodation. In addition to the 4,286 beds actually in use, there are 867 under construction and 1,014 more in the planning stage. When these facilities are completed, we will have 7.3 beds per 1,000 population, exclusive of those in tuberculosis, mental, and federal institutions. This ratio, which includes chronic disease facilities being developed in general hospitals, is, we feel, amply justified and realistic in our highly rural province.

One of the principal factors leading to the demand for expanded hospital facilities is the existence of our hospital care insurance plan. This program, the operation of which is a major admin-

istrative function of the Health Services Planning Commission, has been in effect since January 1, 1947.

It covers about 93 per cent of the provincial population, or over three-quarters of a million people. Public assistance cases receive benefits but are exempt from payment, their taxes being paid by the agencies responsible for their maintenance. The Plan covers everybody except those already provided for by federal or provincial programs for special groups or special conditions. Participation is compulsory except in the remote areas of the Far North where a few thousand trappers and fishermen are being included on a voluntary basis.

The Hospital Services Plan is financed by an annual personal tax of \$5 per capita, with a family maximum of \$30. The tax is collected through about 1,000 municipal offices, a commission being paid for the service. Payments are kept in a special fund to reimburse hospitals on the basis of approved accounts. This fund is supplemented from general provincial revenue, to the extent of approximately 40 per cent of the total cost of the program, the \$5 personal tax making up 60 per cent.

Benefits provided under the Plan include public ward or minimal accommodation, general nursing care, use of operating and delivery rooms, most drugs and medicines in general use, and a range of special services including x-ray and laboratory examinations, radium treatments and physiotherapy. The extra cost of private or semi-private accommodation is paid by the patient. The most important limitation on the service is the exclusion of outpatient treatments.

There is no limit on the length of stay in Saskatchewan hospitals, medical necessity being the sole criterion. There is no restriction on the choice of hospital, payments being made to approved hospitals anywhere in the world. How-

ever, payments for care outside the province are on what amounts to an indemnity basis, and cover only 60 days for any individual in any year.

During the first six months of operation more than \$3,000,000 was paid to Saskatchewan hospitals, in settlement of about 10,000 accounts per month. The average payment per case has been \$48, and the average length of stay about 10 days. This represents about 160 cases or 1,600 days per 1,000 covered population annually, surely a far truer measure of real need than the lower ratios characteristic of voluntary plans, with their limited benefits and selective coverage.

Payments to hospitals are made on the basis of inclusive rates determined according to a schedule of points for assessing the relative adequacy of their facilities. The number of points allotted each institution is determined by our Division of Hospital Planning and Administration by means of individual inspection.

Experience has shown that payments made to hospitals on the basis of their point rating have not been closely related to the cost of operating individual institutions. With the lack of adequate cost data, it was inevitable that the initial payment system should be arbitrary. However, studies are now in progress which should result in the development of a revised payment system for 1948. In the meantime, hospitals—chiefly small institutions—with legitimate operating deficits, are receiving supplemental payments.

Analysis of financial statements has been facilitated by the development of a compulsory uniform accounting system for all general hospitals in the province.

The point system of payment has unquestionably led to improvement in hospital facilities and services, 91 institutions having increased their point allotments since the beginning of the year.

It has been possible for us to guide hospitals in relating their purchase of equipment to actual needs. However, lack of funds, associated with the complete absence of federal support, has made it essential for us to limit our grants for hospital equipment to cases of greatest need.

Similar considerations prevail with respect to grants for hospital construction. Making a comparison on a per capita basis with grants being made under the Hospital Survey and Construction Act, our provincial construction grants amount to approximately two-thirds of those made in the states by the federal government in this country. While we are handicapped by a lack of funds, and are forced to maintain the general principle of local responsibility for capital construction, persuasion is accomplishing a great deal in the direction of our overall objectives.

It is hard to overestimate the value of the prepayment plan in our program of developing a network of functionally related institutions. Not only does the insurance plan make the necessary provision for maintaining hospitals; it fosters the improvement of facilities and it supplies us with a continuous body of data respecting hospital utilization.

Our statistics of hospital use are still in a rudimentary stage, but they already make possible a continuous province-wide study of such factors as the amount and character of hospital service, length of stay and diagnosis by type of institution, the distribution of charges, the relative need for additional facilities by regions, and the efficiency of use of existing facilities.

A good illustration of the use to which data from the hospitalization plan are put in our hospital planning may be found in our study of long-stay cases. Hospitals are required to file reports on all cases hospitalized for more than 3 weeks. These reports, which give social and economic data as well as information

as to sickness, provide us with material for studying the need for facilities for the chronically ill. This information is also an essential element in the co-ordination of our program with social welfare services.

The pattern for the development of hospital services in Saskatchewan is already well established.

Many problems remain unsolved. The

most pressing of these relate to the improvement of standards of service, personnel training, and the development of a satisfactory method of payment. But we are confident that we have established a sound basis for planning, which would have been impossible without full acceptance of the principle of spreading the costs of hospital care across the entire community.

---

## 1948 American Medical Directory

The 18th edition of the *American Medical Directory* is in preparation by the American Medical Association. About November 15, a Directory Card was mailed to every physician in the United States, its dependencies, and Canada, requesting the information to be used in the new *Directory*. It asks that physicians fill out and return these cards promptly even though no change

has occurred in any of the points of information requested and even though a similar card has been sent in recently.

Physicians who have not received one of these information cards should write immediately to the Directory Department of the American Medical Association, 535 North Dearborn Street, Chicago.

# Comparative Epidemiology of Poliomyelitis in Certain California Cities\*

W. McD. HAMMON, M.D., DR.P.H.

*The School of Public Health and the George Williams Hooper Foundation for Medical Research, University of California, Berkeley and San Francisco, Calif.*

WHILE studying the epidemiology of poliomyelitis and encephalitis in the field in certain of the western states, the author became impressed by the apparent excessive rates for poliomyelitis in Kern County, California, in contrast to those in certain other counties in the same and adjacent states. However, it appeared to be impractical to make even relatively accurate comparisons because of the difficulties encountered in the differential diagnosis of poliomyelitis and encephalitis in the San Joaquin Valley (Kern County, California) and because of obviously poor reporting in certain other counties. A search was made therefore, for other more suitable study areas with apparent differences in rates. Los Angeles and San Francisco, from a superficial examination and common "reputation" appeared to be suitable for contrast. The Oakland-Berkeley area near San Francisco, and San Diego, relatively close to Los Angeles, were selected to be included in the study because, though each was near the city primarily selected, marked climatic differences existed. Human encephalitis of the Western equine and St. Louis type had not been recognized as occurring in any of these cities. In the absence of encephalitis of these

types, it was considered that in all probability differential diagnosis had not been unusually complicated, and that morbidity reporting had not been unusually unreliable. All these cities had had city health departments with full-time staff, recording poliomyelitis since 1920. Thus, from 1920 to 1945, records were available for examination.

An attempt has been made to demonstrate whether recorded differences in poliomyelitis mortality and morbidity are real or only apparent; if real, to analyze the differences in an attempt to shed further light on the epidemiology of the disease.

Since the four urban areas under consideration are sufficiently familiar to most members of this audience, little description will be offered. San Francisco, Oakland, and Berkeley are in "northern" California (north of the Tehachapi range). San Francisco lies on a peninsula bounded on the west by the Pacific Ocean, on the north by the Golden Gate Strait, and on the east by San Francisco Bay. A range of low hills extending from north to south divides the city. The bay separates San Francisco from Oakland and Berkeley to the east, by a distance of about 7 miles. Oakland and Berkeley are contiguous. The hills of San Francisco partially shelter the East Bay cities from the ocean breeze and from the banks of fog that frequently form over the ocean and drift over San Francisco. Los Angeles, about four hundred miles

\* Presented before the Epidemiology Section of the American Public Health Association at the Seventy-fifth Annual Meeting in Atlantic City, N. J., October 10, 1947.

Aided by a grant from the National Foundation for Infantile Paralysis, Inc.

to the south, lies slightly (10 to 15 miles) inland, while San Diego, approximately 100 miles south of Los Angeles, is built directly on the coast about San Diego Bay.

Differences in the mean maximum and minimum monthly temperatures can be noted from Chart 1, where the same 5 year period is plotted for each. In all instances for the periods shown, recordings were made from near the heart of the city.

Mean maximum temperatures in the summer are highest in Los Angeles, but it will be noted that the mean minimums in the same months are highest in San Diego. The *mean* monthly temperature during summer (not charted) is two to three degrees higher in Los Angeles than in San Diego. It may also be noted that the extremes between summer and winter temperatures are greater in Los Angeles than in San Diego and San Francisco, but the swings are about the same as those of Oakland and Berkeley.

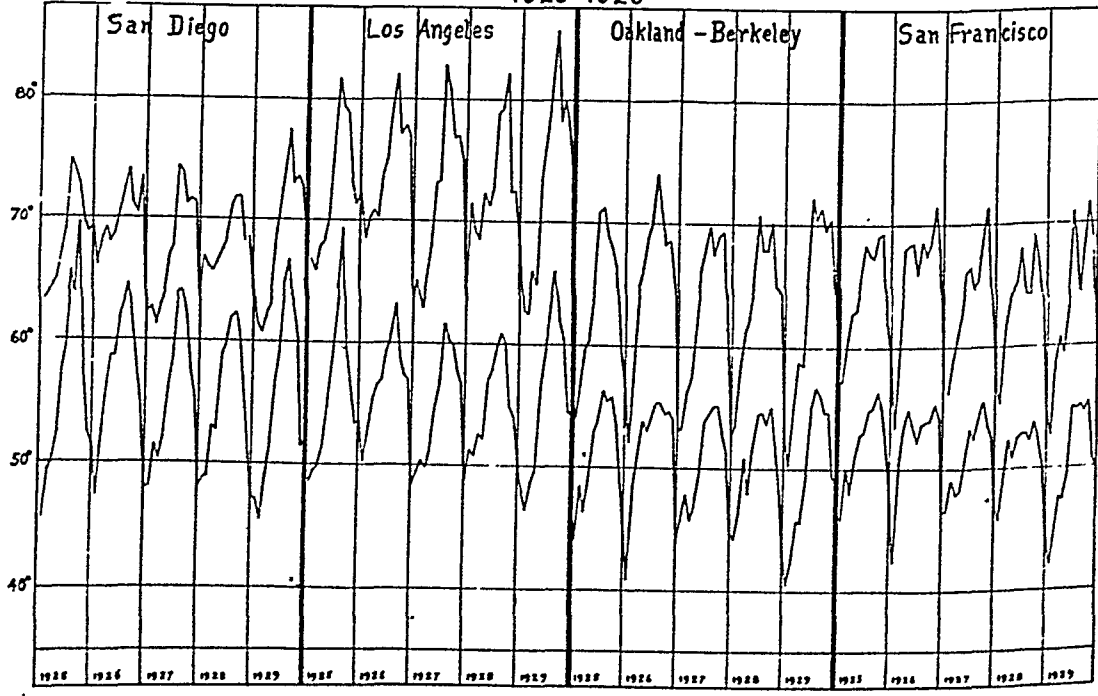
Variation from mean minimums to maximums in the same month (night and day changes) are greatest in Los Angeles. The months of highest summer temperature are either July or August in both southern cities, but the mean for August over a period of many years is the higher in both areas. Peak temperatures in the northern cities are slightly later.

The northern cities, it may be readily observed, have a distinctly cooler climate. San Francisco, by the width of the plateaus on the graph (March through October) and the slighter change from winter to summer, may be noted to have a much more even climate than any of the other cities. In fact, it is quite commonly stated that San Francisco has neither summer nor winter. The seasonal changes are decidedly more distinct in the East Bay.

The age distribution of the population below twenty years of age, prior to the war, was quite similar in all areas,

CHART 1

Maximum and Minimum Mean Monthly Temperatures  
1925-1929



but during and after the war the changes were not uniform. San Diego for example, showed an increase in the age group 15-19 (San Diego Naval Station), while the population in this age group decreased in all other areas.

All four urban communities contain larger numbers of orientals and smaller numbers of Negroes than do most eastern cities, but in no city does the oriental population exceed 3 per cent, or the Negro population 5 per cent. The southern cities contain a higher population of the Mexican, Hawaiian, and Philippine peoples than do those of the north, but no exact figures have been obtained for these.

Both San Francisco and Los Angeles furnish clinical teaching material for two medical schools. Thus, physicians have a high standard of medical, diagnostic acumen, and an interest in co-operation in disease reporting. Berkeley now contains a school of public health, has had one previously, and has for many years had, in the University of California, an active Department of Public Health, and a Department of Public Health Nursing, each with medical and professional faculty partly derived from the East Bay cities. San Diego is not a medical center for civilians, but is an important naval medical center. The Navy's influence on civilian doctors, however, is difficult to evaluate.

All four urban areas conform to the uniform state requirements for poliomyelitis reporting. Until 1927, only paralytic cases were reportable; from then till 1934 non-paralytic cases in the family of a paralytic patient were included, and, since 1934, all cases of poliomyelitis have been reportable.

Data used in this study were collected from the files of the California State Department of Public Health through the kind coöperation of Miss Ida May Stevens of the Division of Communicable Diseases. Cases and deaths have been reallocated to their

place of usual residence, so that rates are not increased in the medical centers by importation of cases from rural and other nearby urban areas. Only cases reported as having occurred within the city limits are included. Army and Navy cases and deaths have been completely excluded since information for reallocation could not be obtained. Because for San Diego the only population data available for 1945 (used for making estimates from 1941 to 1944) included a large Naval population, the rates for San Diego in these years must be assumed to be low.

#### MORTALITY

In Table 1 may be found the mortality rates per 100,000 population by years for the four areas 1920-1945, and in Table 2 the means and medians for the same period. It will be noted that San Diego has the highest median and mean mortality rates and, in descending order, are Los Angeles, Oakland-Berkeley, and San Francisco. The difference between the first (San Diego) and the last (San Francisco) is over twofold in the means, and threefold in the medians. As pointed out above, San Diego rates have been reduced somewhat by excluding Navy deaths; so that the differences may be even greater than shown. Since the completeness of reporting of deaths from this cause can be considered to be relatively the same in all of these cities, and since the diagnosis of fatal poliomyelitis usually presents the least difficulty of any type of the disease, these rates probably represent a relatively true reflection of poliomyelitis mortality.

#### MORBIDITY

##### *Median and Means for Total Period—*

When the median morbidity rates (Tables 1 and 2) are examined for the period of 26 years it is noted that the cities hold the same order as for mortality, San Diego highest and San Fran-

over the radio urging all New Yorkers to be vaccinated without delay. Vaccination clinics in the Health Department headquarters building, in all Health Department health centers, and in the city hospitals were kept open day and night, seven days a week.

Two hundred and fifty thousand individual doses of smallpox vaccine were available for immediate distribution by the Health Department laboratories. Bulk for an additional 400,000 units was on hand. The Bureau of Laboratories began immediate packaging of the bulk, permission having been granted by the U. S. Public Health Service to put this vaccine up in vials containing fifty doses each. The United States Army and Navy sent several hundred thousand units of vaccine gathered from all parts of the country. Since millions of units were needed to vaccinate the people in New York City, and this amount was not available, Mayor O'Dwyer called an emergency meeting at his office. Present at this meeting were representatives of the manufacturers of vaccine, members of the Health Department staff, and Dr. Thomas M. Rivers, Director of the Rockefeller Institute for Medical Research, and a member of the Board of Health. At the urgent request of the Mayor, the manufacturers went on a 24 hour schedule packaging their bulk vaccine and distributing all available supplies to this city. Retail pharmacists cooperated in distributing vaccine to private physicians. Vaccine supply stations were set up at a centrally located police precinct and at the Health Department.

Vaccination stations were set up in all police precincts, in addition to Health Department buildings and municipal hospitals and clinics. There was a total of 179 city installations being used for vaccination. Practically every hospital in the city set up a special clinic where vaccinations were given to all who applied, free of charge. The

vaccine was furnished by the Health Department and was administered by doctors on the hospital staff. Many community organizations set up local centers staffed by volunteer physicians and clerks. Labor and industry cooperated by establishing vaccination stations in factories, offices, and union headquarters. In some cases, their own physicians did the vaccinating; in others, it was performed by Health Department personnel. The stations maintained by the city remained open from 9 a.m. until 10 p.m., including Saturdays and Sundays. On April 26, those at the police precincts were discontinued, and on May 3 all other stations were closed.

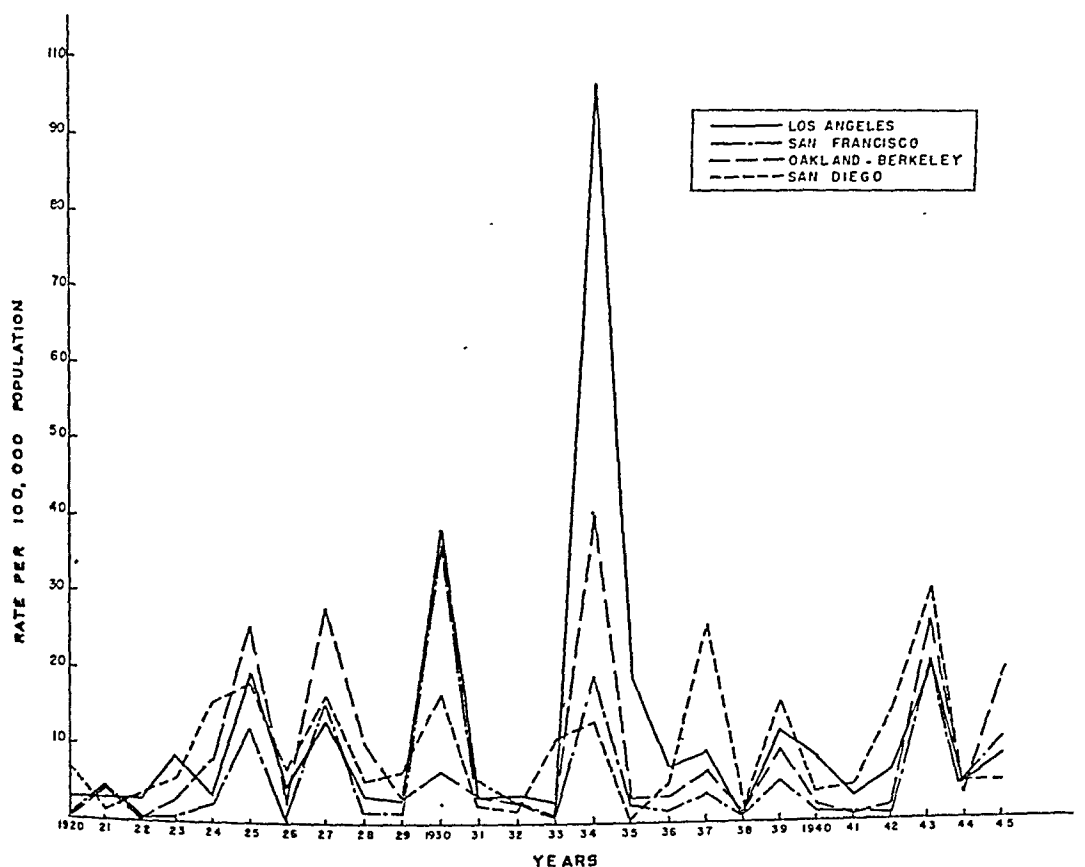
In a period of less than a month more than 6,350,000 people were vaccinated in New York City, over 5,000,000 of them within the two week period following the appeal for universal vaccination made by the Mayor. Never before had so many people in one city been vaccinated in such a short time and on such short notice. Thanks are due to the press and radio for giving so generously of their space and time to bring necessary information to the public. Had it not been for them and for the intelligent cooperation of the public and the generosity of private physicians and volunteer workers, notably from the American Red Cross and the American Women's Voluntary Services and former Air Raid Warden groups, it would have been impossible to have achieved this remarkable record.

#### WHAT MIGHT HAVE HAPPENED

The introduction of virulent smallpox into a community, especially a large cosmopolitan city with rail, ship, and air connections with the rest of the nation and many parts of the world, could be a major catastrophe. For example, in 1945 in the Puget Sound area around Seattle, there were 65 cases of

CHART 2

ANNUAL TOTAL YEARLY RATES PER 100,000 POPULATION FOR FOUR URBAN AREAS



data for any differences that would render the populations incomparable. In regard to the latter, the differences in the small minority population groups pointed out above, would hardly explain the apparent large differences in rates noted between the northern and southern cities.

#### General Trends—

The validity of figures over a period of 10 or 15 years could be questioned because of the possibility that during such a short period of time not enough epidemic years for one or more cities would be included. Such a city might have experienced its epidemics in a slightly different cycle. Table 1 and Chart 2 showing the annual rates for 26 years reveal that, as a whole, all four

cities experienced the same epidemic cycles, 1925, 1927, 1930, 1934, 1939, and 1943. San Diego, however, experienced less sharp outbreaks (never a rate above 30), and had one extra outbreak in 1937. Occasionally it had two years in succession with rates above 10. Such epidemic rates were not typical of the other cities. San Francisco and Oakland-Berkeley had maximal rates of approximately 37 and 40 respectively, and San Francisco had only one other year with a rate as high as 20, and frequently had rates of less than 1. San Diego and Los Angeles each had only one year with a rate below 1.

The general trends of both mortality and morbidity for the four areas for the 26 years (Table 1) have been similar to those for the United States in gen-



eral<sup>1</sup> and for Massachusetts.<sup>2</sup> Getting and Rubenstein have discussed these recently. Since the findings are similar for each study area, discussion will not be extended.

#### Seasonal Pattern—

Next, the monthly occurrence of reported infections has been examined. Cases, rates, and per cent distribution by month were tabulated for each year. Summaries of these for the 26 years are shown in Tables 3, 4, and 5 and in Charts 3 and 4. The seasonal distribution of the numbers and per cent of cases as shown in Table 3 and the mean monthly rates in Chart 3 give only the pattern of numbers, influenced predominantly by one or two epidemic years. For example, in the epidemic of 1934 in Los Angeles, a very unusual one in many respects, there were 534 cases (41.17 per cent of the total, or a rate of 39.56) in the month of June alone. This warps the peak of cases and mean of rates (Chart 3) to June, for the whole 26 years. Oakland-Berkeley, similarly, by the epidemic of 1934 has an apparent peak in June. Nevertheless, when

we examine Table 4 for the mean and median of the *per cent distribution by months* for the period of years, and Chart 4 for the median of the *monthly rates*, August appears to be the month most frequently showing the peak incidence of disease in both Los Angeles and San Diego. Examined in the same way, San Francisco shows a later peak (October), while Oakland-Berkeley, despite its geographical proximity to and a great daily intermingling of populations with San Francisco, shows a double peak by these three methods [highest in July, next highest in October, by mean and median of per cent distribution (Table 4) and highest in October with secondary peak in August by median of rates (Table 5 and Chart 4)].

When monthly mean maximum temperature peaks are compared to the median monthly rates for the southern and northern cities (Chart 4) it is observed that the peaks for infection rates are directly related to the times of highest monthly mean maximum temperatures—onset of largest number of cases occurring one month after the peak temperature.

Through the late winter and spring months neither the medians of monthly rates (Table 5) nor the medians of the per cent distribution by month (Table 4) can serve for comparison of three of the cities, for no cases occurred in many of the winter months during most years, resulting in medians of 0. It would thus appear at first, that persistence of infection throughout the late winter and spring was a peculiar characteristic of Los Angeles only, whose medians do appear in the tables. This, however, is probably only a factor of its greater population with increased opportunity for a few cases to be recognized during each winter month; for, on examining the *mean* per cent distribution (Table 4) it will be noted that both Oakland-Berkeley and San Francisco exceed Los

CHART 3

MEAN MONTHLY RATES PER 100,000 FOR PERIOD 1920-1945 FOR FOUR URBAN AREAS

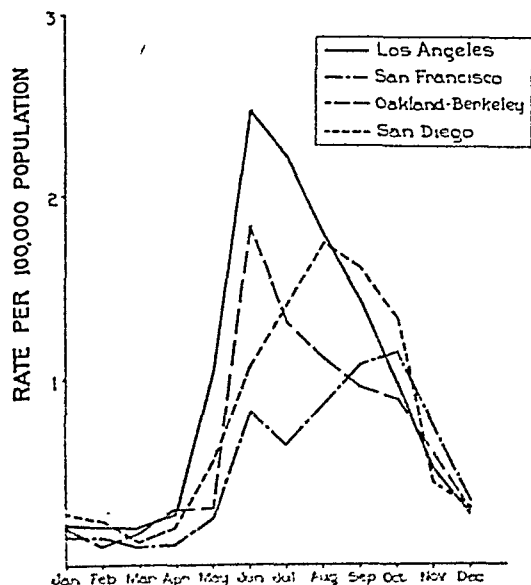


TABLE 3

*Number and Per cent of Cases by Month of Onset in Four Urban Areas, 1920-1945*

	Number of Cases				Per cent of Cases			
	San Diego	Los Angeles	Oakland-Berkeley	San Francisco	San Diego	Los Angeles	Oakland-Berkeley	San Francisco
January	10	17	16	24	2.4	1.7	2.0	2.2
February	10	69	8	21	2.4	1.7	0.9	2.0
March	6	64	16	14	1.4	1.6	2.0	1.3
April	7	87	26	16	1.7	2.2	3.1	1.5
May	21	362	29	38	4.8	9.0	3.5	3.6
June	45	865	183	125	10.4	21.6	22.0	12.4
July	60	740	136	103	13.8	18.5	16.3	10.1
August	93	631	120	136	20.7	15.8	15.4	13.5
September	85	507	103	182	19.5	12.7	12.6	18.0
October	63	334	97	192	14.5	8.3	11.4	19.0
November	24	182	63	116	5.6	4.5	7.6	11.5
December	12	90	26	38	2.8	2.2	3.2	3.7
Total	436	4,002	823	1,005	100.0	100.0	100.0	100.0

TABLE 4

*Mean and Median of Annual Per cent Distribution of Cases by Month of Onset in Four Urban Areas, 1920-1945*

	Mean				Median			
	San Diego	Los Angeles	Oakland-Berkeley	San Francisco	San Diego	Los Angeles	Oakland-Berkeley	San Francisco
January	4.37	4.59	3.61	4.41	....	3.50	....	....
February	6.86	3.91	2.20	5.37	....	3.58	....	....
March	1.76	2.45	3.80	1.55	....	1.63	....	....
April	2.46	4.16	3.84	3.30	....	3.86	....	....
May	7.26	4.83	3.37	3.32	....	4.39	....	....
June	8.55	11.19	8.52	10.27	....	8.76	1.48	4.40
July	12.06	13.94	16.17	8.54	9.72	11.11	12.25	5.88
August	19.09	15.91	11.53	12.40	16.02	15.07	9.72	9.54
September	16.56	14.68	10.72	15.71	14.16	13.66	10.56	15.22
October	12.46	12.39	14.27	18.12	11.32	9.87	11.80	17.65
November	5.31	6.83	12.77	9.88	3.54	4.94	8.48	9.65
December	3.25	4.66	5.36	7.12	....	3.03	0.53	3.12

TABLE 5

*Mean and Median of Rates per 100,000 Population by Month of Onset, 1920-1945*

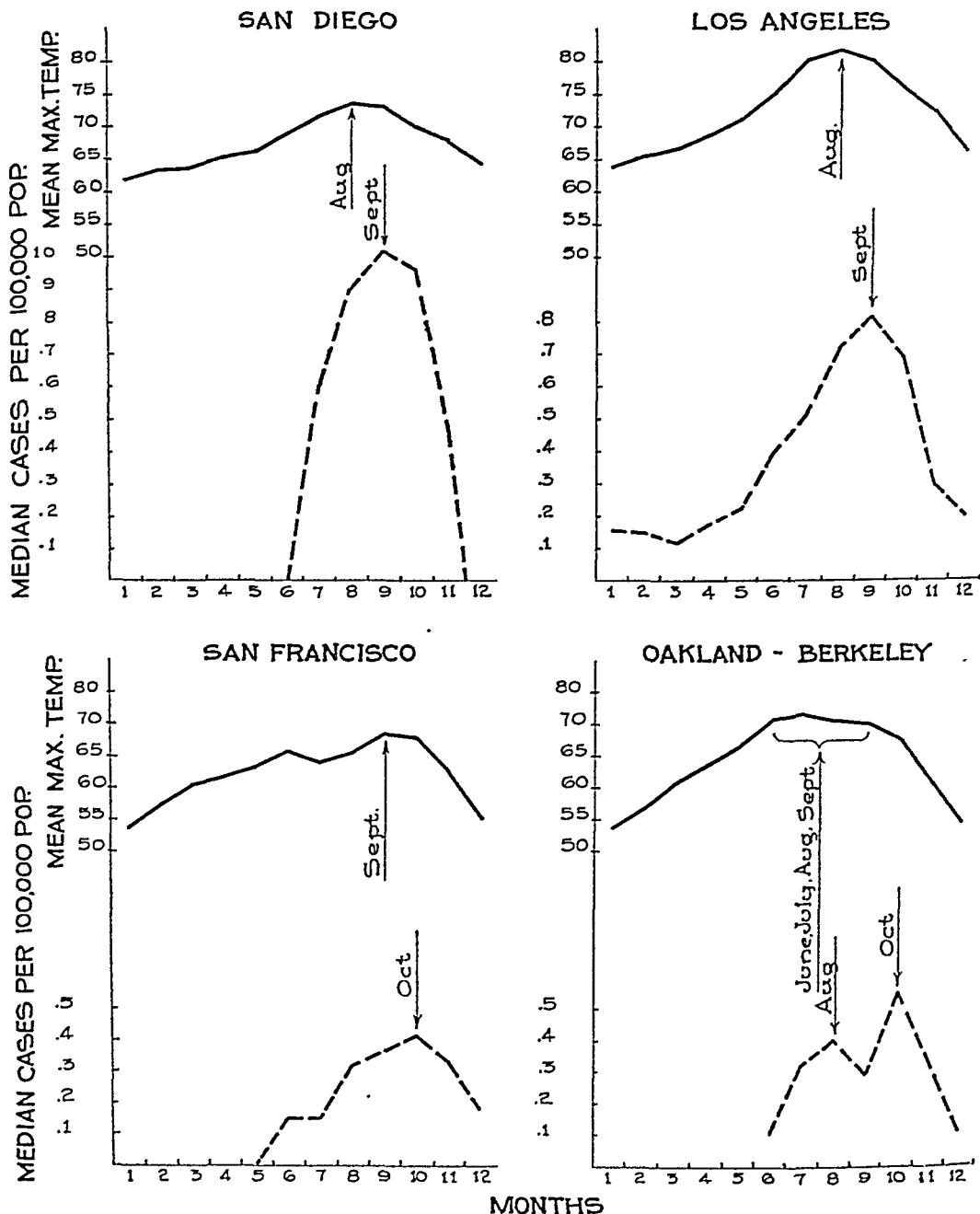
	Mean				Median			
	San Diego	Los Angeles	Oakland-Berkeley	San Francisco	San Diego	Los Angeles	Oakland-Berkeley	San Francisco
January	0.26	0.22	0.20	0.15	....	0.16	....	....
February	0.23	0.21	0.09	0.13	....	0.15	....	....
March	0.12	0.19	0.17	0.09	....	0.12	....	....
April	0.20	0.27	0.28	0.11	....	0.18	....	....
May	0.56	1.04	0.30	0.25	....	0.23	....	....
June	1.08	2.53	1.90	0.83	....	0.40	0.10	0.16
July	1.42	2.28	1.37	0.67	0.61	0.53	0.33	0.16
August	1.82	1.86	1.18	0.88	0.91	0.72	0.40	0.32
September	1.68	1.47	1.03	1.16	1.07	0.82	0.30	0.36
October	1.40	1.02	0.96	1.22	0.91	0.68	0.60	0.42
November	0.45	0.53	0.65	0.72	0.38	0.32	0.33	0.32
December	0.27	0.27	0.28	0.24	....	0.20	0.10	0.16

Angeles in December, as do San Diego and San Francisco in January and February, and as does Oakland in March.

At this time the question might be posed: Can we draw any conclusions from these data as to the effect of temperature on the epidemiology of polio-

CHART 4

# MEAN MAXIMUM MONTHLY TEMPERATURE AND MEDIAN MONTHLY RATES PER 100,000 IN FOUR URBAN AREAS 1920 - 1945



myelitis? The answer is no! A review of the literature on the subject would be very time-consuming and offers no definite proof of any fact save that epidemics of poliomyelitis usually occur during the summer. However, one may

be permitted to speculate somewhat in the hope that further study will be stimulated to prove or to disprove any hypotheses which might be advanced. Possibly the relatively high, sustained temperatures (high summer minimums

or possibly mild winters) of an area like San Diego contribute to high endemicity, contribute to an environment conducive to the ready spread of the infection to a high proportion of the susceptibles annually, and thus tend to prevent large epidemics. Possibly the greater seasonal changes of Los Angeles and Berkeley produce physiological changes in the host and thus may render a higher proportion of the population susceptible to recognizable infection when exposed. Exposure of large numbers then occurs when there is occasionally a *chance correlation* of circumstances in the environment leading to *ready* spread of infection. Then, an epidemic occurs. Because of the usual wider swings of daily temperature or some related factor, these circumstances do not occur annually in Los Angeles or in Berkeley-Oakland. To carry comparisons further it might be suggested that the greater seasonal differences occurring in eastern cities produce greater physiological changes in the population. In these eastern cities more severe epidemics occur, with rates above 100 per 100,000, higher than have been recorded in any of these western cities. Possibly San Francisco has such remarkably low rates and freedom from all but mild epidemics because it is cool, or its population is sheltered from marked seasonal changes in temperature, or both. These are but a few of many suggestions that might be made. The author subscribes to none of them at the present time, but would welcome proof establishing or eliminating any of these hypotheses or others which have not been mentioned. Undoubtedly, the factors are complex, but it is quite possible that some important ones may be quite simple.

#### *Age Distribution—*

One of the most important and possibly most interesting phases to be considered is the question of difference in age distribution of cases between the

four communities. First, the trend in age distribution for each area will be examined. In order to make the data strictly comparable, all age-specific rates for each year have been adjusted to the population distribution of one of the cities.

On a first glance at the complete tabulation by five year age groups for each year by each city (tables not included) it became apparent that in the large epidemics in 1934 which affected principally Los Angeles, but also affected significantly the two northern cities, there was an unusually high percentage of adult cases. The peculiarity of this epidemic has been discussed previously in a number of other publications. In fact, it is questioned by many whether much of that which was reported as poliomyelitis in adults might not have been another disease. The influence of this strain of virus (if such is the explanation) can be noted in most areas of California through 1937; then the age distribution of other years appears to have become reestablished. Because of this unusual period, these four years, (1934–1937) are grouped together. The period before (1922–1933) has been divided into two series of 6 years each, and the last period of 8 years (1938–1945) has been treated as another group. Table 6 presents the grouped, age-adjusted rates and the per cent distribution of these by time periods for each of the four areas. Five age groups have been considered (0–4, 5–9, 10–14, 15–19 and 20+ years). The per cent distribution, only, is presented graphically in Chart 5.

In the age group 0–4 it will be noted that in all areas there has been a downward trend from 1922 to 1945. An irregularity however will be noted for the years 1934–1937 where the decrease was more marked, particularly in Los Angeles and in Oakland-Berkeley. San Francisco and San Diego were less affected. It may be noted also in Table

6 that the four cities maintain their same relative position for morbidity in this one age group as they did for total rates, San Diego, Los Angeles, Oakland-Berkeley, San Francisco. Data in Chart 5 cannot be compared in this manner since they represent per cent distribution of rates per age group. In the age groups 5-9 and 10-14 no significant change in the trend of the per cent

distribution of rates has occurred (Chart 5). The relative positions of rates for all cities for these periods of time show considerable change, but the most striking change is again that due to the epidemic of 1934 in Los Angeles.

In the 15-19 and 20+ age groups a general increase in trend is noted. This is greatest in the older age group (Chart 5). The unusual 1934 outbreak shows

CHART 5

PERCENT DISTRIBUTION BY AGE GROUPS OF CUMULATED AGE ADJUSTED RATES  
FOR FOUR PERIODS OF TIME IN FOUR URBAN AREAS

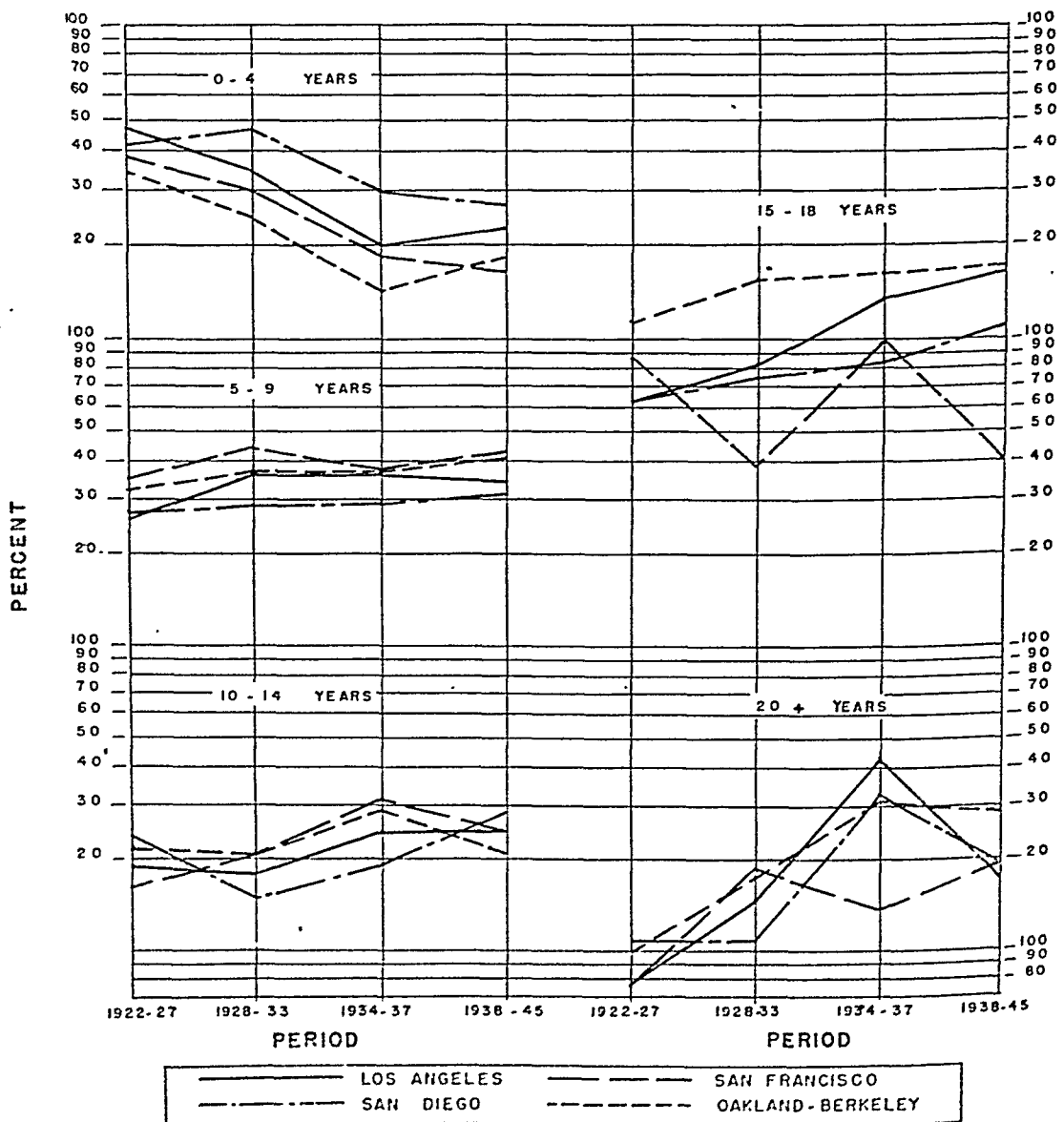


TABLE 6

Per cent Distribution and Cumulated Age-Adjusted Rates by Age Groups for Four Periods of Time in Four Urban Areas

	1922-27		1928-33		1934-37		1938-45	
	Rate	Per cent	Rate	Per cent	Rate	Per cent	Rate	Per cent
0-4 Years								
San Diego	402.9	41.0	271.0	47.9	149.6	29.6	287.7	27.1
Los Angeles	392.9	47.5	254.2	34.9	283.4	20.0	200.8	22.4
Oakland-Berkeley	345.2	33.3	81.3	24.1	85.3	14.2	144.1	18.2
San Francisco	229.5	38.1	214.9	29.9	79.7	18.6	120.8	16.8
5-9 Years								
San Diego	265.8	27.1	161.4	28.5	198.6	39.4	328.5	31.0
Los Angeles	215.8	26.1	270.7	37.1	517.2	36.6	310.5	34.8
Oakland-Berkeley	332.6	32.0	126.3	37.5	224.0	37.2	325.5	41.0
San Francisco	215.6	35.8	309.9	43.1	163.3	38.1	305.1	42.7
10-14 Years								
San Diego	237.6	24.2	84.1	15.0	98.3	19.5	304.0	28.7
Los Angeles	159.7	19.3	131.9	18.0	358.9	25.1	217.9	24.5
Oakland-Berkeley	230.1	22.2	70.3	20.8	176.6	29.3	166.1	20.9
San Francisco	99.7	16.5	151.4	21.1	135.9	31.7	174.3	24.4
15-19 Years								
San Diego	64.1	6.5	42.7	7.6	41.3	8.2	117.7	11.1
Los Angeles	51.8	6.3	60.2	8.3	192.7	13.6	147.5	16.6
Oakland-Berkeley	118.6	11.4	53.3	15.8	97.2	16.1	134.5	17.0
San Francisco	53.0	8.8	28.4	3.9	43.1	10.0	100.5	14.0
20+ Years								
San Diego	10.9	1.1	6.7	1.1	16.8	3.3	21.3	2.0
Los Angeles	6.7	0.8	11.0	1.5	62.1	4.4	15.4	1.7
Oakland-Berkeley	10.5	1.0	5.9	1.8	18.9	3.1	22.6	2.8
San Francisco	4.6	0.8	13.7	1.9	6.1	1.4	14.2	2.0

TABLE 7

Mean and Median Age-Adjusted Rates per 100,000 Population in Four Urban Areas, 1920-1945

Area	Age									
	0-4		5-9		10-14		15-19		20+	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
San Diego	44.2	29.3	38.2	29.8	29.4	22.8	9.2	7.3	2.2	1.9
Los Angeles	45.4	23.1	52.6	25.2	34.3	17.5	17.7	11.2	3.7	1.2
Oakland-Berkeley	26.5	10.3	40.3	19.2	15.5	11.6	15.5	6.8	2.3	1.0
San Francisco	24.9	10.3	38.2	16.2	21.6	10.3	8.6	3.0	1.5	0.3

its effect principally on the group over 20 years, again particularly in Los Angeles. Apparently an opposite trend occurred in San Francisco. The great irregularities in the 15-19 group for San Francisco are partially reflected in this latter irregularity. In these last two age groups the relative standing of the rates is again affected markedly by epidemic years when examined for the 1934-1937 year group (Table 6). It will also be noted that in the period 1938-1945 San Diego's rate for the 15-19 year age group is completely out of

line, lower even than San Francisco's. The reasons for this obvious inaccuracy have been explained previously.

Since apparently, there have been relatively similar trends in these four areas throughout the 26 year period, it is probably safe to examine the means and particularly the medians of the age-adjusted rates for the total span of years. These are presented in Table 7. In Table 8 the mean and median per cent of cases by age groups is presented. The cases have not been adjusted for age differences in population, but, as

above grew also on the gentian violet plates as a mucoid translucent colony. These colonies were counted, picked, and set up directly in types 23 and 32 pneumococcal typing sera for identification.

#### *Ward Technique of Handling Patients*

—In so far as possible, an aseptic technique was followed when caring for the infants. Gowns, hung in the open ward at the entrance of each cubicle, were worn by the nurses and attendants when the infants were fed, dressed, changed, and had their beds made. Masks were also worn when very young infants were handled. Gowns were changed and hands washed thoroughly before and after caring for each patient. Attendants with upper respiratory infections were isolated during the acute phases of illness or required to wear masks while on the wards. In the case of emergencies and during ward rounds these techniques were not always carried out.

*Patients*—Infants from 1 day to 2 years of age were admitted to the wards with a wide variety of medical and surgical illnesses. There were 130 patients in the control and 140 in the test wards who stayed a sufficient length of time (5 days) to be included in the study. They were admitted, as far as possible, alternately to the test and control wards. In a few instances, some cases were shifted purposely from one ward to another. As shown in Table 1, the mean age of the patients and the time spent in the hospital were comparable on the two wards.

Approximately half of the patients had respiratory tract or skin infections at the time of admission. The results of the admission nasopharyngeal cultures are shown in Table 2. There were only 3 cases admitted to the wards with cultures positive for hemolytic streptococci. Actually, one of the cases on the test ward was a transfer from the control ward with the positive culture. The majority of the infants showed positive cultures for one or more types

TABLE 1

*Comparison of Experience of Patients with Respect to Age and Time Spent in Hospital*

<i>Wards</i>	<i>Control</i>	<i>Test</i>
Total admissions	130	140
Total hospital days	2,402	2,221
Mean number of days per patient	18.5	15.2
Mean (months) age on admission	7.6	7.3
Age (months) distribution of hospital days on ward		
25 per cent under	3.0	3.2
50 per cent under	7.0	6.1
75 per cent under	10.7	9.2
25 per cent over	10.7	9.2

TABLE 2

*Admissions with Respiratory or Skin Infections and Positive Nasopharyngeal Cultures for Pneumococci, H. Streptococci and Specific Gram-negative Bacillus*

<i>Wards</i>	<i>Control</i>	<i>Test</i>
Total Admissions	130	140
Admissions with Respiratory or Skin Infections	54	48
Nasopharyngeal Cultures		
Beta Hemolytic Streptococci (group A, types 2, 33)	1	2
Gram-negative Bacillus	2	1
Pneumococci (different strains)	67	96
Per cent most frequent		
*Pneumococcal Types (6, 14, 19, 23)	55	44
Per cent (24) additional types	45	56

of pneumococci. The most prevalent types, which made up approximately 50 per cent of the strains isolated, were 6, 14, 19, and 23. Twenty-four additional pneumococcal types were isolated (Table 2).

#### *Sulfonamide and Antibiotic Therapy*

—Soon after the study began it became evident that consideration would have to be given to the use of sulfonamides and penicillin on the wards. These drugs, although of great benefit to the patient because of their antibacterial activity, constituted a factor which must be considered in the analysis of the findings if the experience of the two wards was to be compared. Accordingly, the experience of the patients in each of the two wards was divided into: (a) hospital days with no chemotherapy, and (b) hospital days with chemo-

constant but serious danger does not make newspaper headlines! For example, in recent years, many parents have hesitated considerably to take their children to Los Angeles during the summer because of its local reputation for frequent poliomyelitis "epidemics." Many have repeatedly sought advice of the author and others in various health departments in regard to the dangers of a visit to this southern city or to its neighboring communities. To my knowledge, such a question has never been raised regarding the "epidemic-free" city of San Diego which, while it maintains a high "endemic" rate, does not make spectacular headlines.

Paul<sup>5</sup> recently has reported the mortality rates for poliomyelitis in Japan, 1923 to 1943, and noted that although epidemics have been rare, the average overall mortality rate for this period differs little from that observed in the same period in the United States. Reported cases in Japan occur relatively more frequently in the 0-4 year age group than those reported in recent years in the United States. Since the general level of physician training and probably the accuracy of diagnosis in Japan may be considered well below that in the United States, the rates reported are probably lower than they should be for real accuracy. It should be noted that the extremely low rates quoted from many tropical countries may in no way accurately reflect the incidence of poliomyelitis, but rather indicate the low standard of diagnosis and reporting.

One other interesting observation may be made from Chart 6 of the median per cent of cases by age groups. Berkeley has a higher per cent of cases in the age group 15-19 than do the other cities. It seems probable that the enormous population of the University of California results in this peculiar age distribution of cases. On the basis of age-adjusted rates it is not out of line.

The most marked differences in the four urban areas of California appear in the age group 5-9. San Francisco (Table 7) although it still holds lowest place in the median of the rates for this age group (about one-half of that of San Diego) and ties for the lowest position in the mean of the rates, has a higher proportion of its total number of cases in this age group, on the basis of either mean or median (Chart 6, Table 8), than do any of the other cities. In fact, these four cities by both means and medians of the relative distribution of cases by age group, assume the inverse relationship of the order of total rates, in the 0-4 year age group, or per cent of cases in the 0-4 year age group. It would thus appear that the trend of difference in per cent of cases between the 0-4 and 5-9 year age groups might in some way be a measure of, or at least be related to, the total incidence of the disease in a community, or of the factors disposing to the disease. This conjecture should receive further study in many communities before it may be accepted or rejected.

Differences in the medians of the age-adjusted rates for the remaining, three older age groups (Table 7), quite consistently hold the order of incidence maintained generally by the four cities. In other words, in any one year (on the basis of a median) at any age, one is apparently less likely to develop infantile paralysis in San Francisco than in any of the other areas studied, and is most likely to develop it in San Diego. The one apparent exception to the latter is the 15-19 age group which we have pointed out shows rates which are obviously too low. On the basis of means *reflecting a 26 year period of exposure in any one age group*, one is still safest in San Francisco except during the years from 10 to 14 when Berkeley or Oakland might be a safer place of residence. However, one's greatest danger at any age for prolonged residence would



possibly be in Los Angeles. Here, though infection during non-epidemic years is less likely to occur than in San Diego, chances of infection are greatly increased during an epidemic year. This short digression into impractical and possibly ludicrous interpretation has for its purpose simply to show the significance of the means and medians used in this phase of the study. Of course, the writer prefers to keep his family in San Francisco, but should he be forced to choose between San Diego and Los Angeles, other factors would have to be considered in making the decision.

Before closing, a word to anticipate the questions of the statisticians may be in order. Where are the standard deviations for rates and means? Are the differences shown and discussed statistically significant? There has been careful avoidance of any claim up to this point that any of the differences are significant, and the discussion has been based on apparent differences only. However, the consistency of the findings through the breakdowns, by age

groups and by periods of years, with rather obvious explanations available for the few discrepancies encountered, lends considerable weight to the probable significance of at least the more marked differences noted.

**ACKNOWLEDGMENT**—Much of the original data were collected as a student project from the files of the California State Department of Public Health, under the supervision of Miss Ida May Stevens, of the Division of Communicable Diseases, by Mrs. Toshiko S. Yoshida. The author was assisted in making the tabulations, and calculations by Mrs. Susa H. Condliffe and Mrs. Fern E. French.

#### REFERENCES

1. Gettling, V. A., and Rubenstein, A. D. Special Report to the Department of Public Health Relative to the Cause and the Eradication Thereof of Poliomyelitis in the Commonwealth of Massachusetts. *S 50*, (Jan.), 1947.
2. ———, Facts and Figures About Infantile Paralysis, The National Foundation for Infantile Paralysis, Inc., New York, *Publ. 59*, p. 22.
3. Sabin, A. B. Epidemiology of Poliomyelitis, *J.A.M.A.*, 134:749-756, 1947.
4. Nelson, Norman. Susceptibility and Immunity in Poliomyelitis, *J. Immunol.*, 56:311-316, 1947.
5. Paul, John R. Poliomyelitis in Japan, *Am. J. Hyg.*, 45:206-218, 1947.

---

## Antibiotic Symposium

The Medical Sciences Section of the American Association for the Advancement of Science will present a symposium on Antibiotics on December 29 and 30 in connection with the Annual

Meeting of that Association in Chicago, December 26-31. This symposium will be given in four half-day sessions at the Hotel Sherman, beginning at 9:00 A.M., Monday, December 29.

# Methods of Removing Fluorides from Water\*

F. J. MAIER, B.S.M.E., B.S.C.E., F.A.P.H.A.

*Sanitary Engineer, Dental Public Health Section, States Relations Division,  
U. S. Public Health Service, Washington, D. C.*

## INTRODUCTION

FLUORIDES in drinking water can be beneficial or detrimental depending on their concentration. Recent epidemiological studies have indicated that there is an inverse relationship between fluorides and dental caries experience.<sup>19, 22, 24</sup> The promise which this relationship holds for mass control of dental decay, however, hinges on the fact that an optimal caries prophylactic effect of the fluoride is obtained within the range of 1.0 to 1.5 parts per million (p.p.m.). Greater concentrations are associated with a hypoplasia of the teeth known as mottled enamel or dental fluorosis. It is the purpose of this presentation to examine current methods for removing excessive fluorides from communal water supplies in order to prevent the occurrence of dental fluorosis. Inasmuch as present evidence suggests that the removal process should not effect a fluoride reduction below 1.0 p.p.m. in order that the beneficial effect of caries inhibition may be retained, this discussion will be concerned with the defluorination of water to the optimal limit.

Near the beginning of the 20th century mottled enamel had been noted and described.<sup>25</sup> Despite the intensive researches of several investigators, however, it was not until 1931 that its

cause was correctly determined and announced, almost simultaneously, by Churchill,<sup>14</sup> Smith,<sup>49</sup> and Velu.<sup>59</sup> Since the discovery that fluorides were the cause of mottled enamel in the permanent teeth of children, the problem of removing excess fluorides from drinking water has been studied widely.

In 1935, Dean and Elvove<sup>16-18, 21</sup> began to publish the results of their epidemiological studies relating to minimal concentrations of fluorides sufficient to produce mottling. They found that a fluoride concentration of 1.0 p.p.m. or less in a communal water supply produced no significant mottling of the teeth of children who had been using this water continuously. With higher concentrations, mottling was progressively more severe and above 6.0 p.p.m. almost all children were afflicted. In addition to mottling at this high concentration, gross calcification defects and attrition of the enamel were observed. For this reason, the dental defects caused by fluorides in drinking water are better termed dental fluorosis.

After the cause of dental fluorosis was discovered, several methods were devised for removing excessive fluorides from water. Nevertheless, at the present time (excepting some lime softening plants) only one community is known to be utilizing equipment specifically installed to reduce the fluoride content of its water supply. The lack of application of preventive measures maintains despite the undesirable disfigurement

\* Presented before the Dental Health Section of the American Public Health Association at the Seventy-fifth Annual Meeting in Atlantic City, N. J., October 7, 1947.

associated with fluorosis, the increased costs of dental care and the fact that the number of persons using water containing excessive fluorides (over 1.5 p.p.m.) exceeds 1,000,000 persons in over 500 communities.<sup>58</sup> This situation may be attributed to a combination of several factors, most important of which are the high capital and predicted operating costs of the removal processes and the complexity of the operating procedures.

It is impossible or impracticable in many communities to change the source of supply to one having a satisfactory fluoride concentration. Dental studies have been made in three communities, however, which previously used water high in fluorides and then changed to other sources having little or no fluorides.<sup>23</sup> The change resulted in no additional cases of fluorosis.<sup>20, 40</sup> No community has as yet removed excessive fluorides from its water and subsequently measured the results in terms of a reduction in the incidence of fluorosis.

#### FLUORIDE REMOVAL METHODS

The methods utilizing the fluoride exchange properties of the apatites, such as those involving the use of the constituents of bone, the ion exchange principle, and those depending on the sorptive properties of aluminum compounds, appear to show the most promise for removing excess fluorides from water. In addition, where the fluoride concentration is not very high (less than 4.0 p.p.m.), processes involving the concurrent removal of magnesium are indicated, if hardness reduction is also contemplated.

#### CALCIUM PHOSPHATES

The use of bone for removing fluorides is based on the long known affinity of bone for fluorides. Probably the most plausible theory of the chemistry of this affinity may be explained on the

basis of the anion exchange properties of apatites. The carbonate radical in the apatite comprising bone,  $n\text{Ca}_3(\text{PO}_4)_2 \cdot \text{CaCO}_3$  is replaced by the fluorides in the water, forming an insoluble fluorapatite.<sup>50</sup> In the regeneration of the material with sodium hydroxide the fluorapatite probably becomes an hydroxy-apatite and the fluorides are removed in the form of soluble sodium fluoride. The hydroxy-apatite subsequently becomes available as an exchange material by the replacement of its hydroxy radical with fluoride.

One method of preparing bone for use as a fluoride removing agent<sup>51</sup> involves boiling to remove the fat and most of the protein. It is then crushed and boiled in a solution of sodium hydroxide. The caustic is removed by thorough washing and finally is neutralized with hydrochloric acid. The material is again washed and then dried and graded for fineness. Home filters in which the prepared bone is utilized are available but there have been some objections to the taste of the treated water. Based on the expense of renewing the bone media in home filters, the cost of using this method in a municipal plant would be exorbitant (approximately \$25,000 per m.g.).<sup>\*</sup> It is reported<sup>50</sup> that the material can be regenerated successfully by a sodium hydroxide and acid wash method, similar to that used in its preparation. Data are not available on the removal capacity of the bone after it has been subjected to numerous regenerative cycles when used with waters naturally high in fluorides and other mineral contaminants.

A similar process utilizes virgin bone black (animal charcoal) which is essentially tricalcium phosphate and carbon.<sup>13</sup>

\* All chemical cost estimates, except where otherwise noted, are based on a fluoride ion (F<sup>-</sup>) reduction from 6.0 p.p.m. to 1.0 p.p.m. at current (1947) chemical quotations.

In its limited use in household filter units, the material is discarded when its exchange capacity is exhausted. In a municipal installation, the cost of this procedure would be excessive (\$5,000 per m.g.). Regeneration of the material has been effected with solutions of trisodium phosphate and mono-sodium phosphate but the exchange capacity of the bed is reduced by 12 per cent after the first regeneration.

The principal chemical constituent of bone, tricalcium phosphate, can be prepared from phosphoric acid and milk of lime. The product consists essentially of tricalcium phosphate and its hydroxyapatite. Because it forms a gelatinous floc in water, fluoride removal is probably accomplished by adsorption together with the formation of a fluorapatite.<sup>1, 26, 28</sup>

A porous, granular type of tricalcium phosphate has been developed for use in contact filters.<sup>3</sup> When the fluoride removal capacity of the bed is exhausted, the material can be regenerated with a 1 per cent sodium hydroxide solution. About one pound of caustic soda is required for each cu. ft. of tricalcium phosphate.<sup>30</sup> The causticity of the bed is then neutralized by thorough washing with water and with a carbon dioxide solution.<sup>7</sup> The use of carbon dioxide for this purpose, rather than hydrochloric acid as originally proposed, greatly increases the life of the bed and considerably reduces attrition losses.<sup>8</sup> The rated removal capacity of tricalcium phosphate is 300 grains of fluoride per cu. ft. but this capacity decreases about 3 per cent for each 100 p.p.m. sulfates present in the water. The iron content of the water must be reduced to 0.10 p.p.m. in order to prevent clogging of the filter. A water treatment plant using this material has been operated since 1937.<sup>60</sup> The fluoride content of the raw water varied from 2.0 to 14.0 p.p.m. and averaged about 8.3 p.p.m. The effluent contained an average of

0.6 p.p.m. The chemical costs for the fluoride removal process at this plant totaled about \$130 per m.g. in 1944.

Tricalcium phosphate can also be formed from ortho-phosphoric acid and lime within the mixing chamber of the conventional type of treatment plant (mixing flocculation, settling and filtration).<sup>37, 38</sup> The tricalcium phosphate thus formed must be removed continuously from the water and discarded. The chemical cost of this process amounts to approximately \$245 per m.g. A similar material for fluoride removal, trimagnesium phosphate, has been suggested,<sup>2</sup> but is reported to be less efficient and more expensive than tricalcium phosphate.

#### ADSORPTION WITH ALUMINUM COMPOUNDS

In addition to the constituents of bone for fluoride removals, a large number of other materials have been tested. These materials include aluminum sulfate, sodium aluminate, zeolites, bauxite, silica gel, sodium silicate, ferric fluoride, lime,<sup>11</sup> and various adsorbent clays and earths.<sup>41</sup> With the exception of aluminum sulfate, all of these materials have been found to be impracticable probably because of the very low initial concentration of the fluoride ion, and in some instances because an undesirable proportion of the reagent remains in the water due to the excessive amounts of chemicals required. Aluminum sulfate and other aluminum salts have been used in combination with insoluble compounds in contact beds or as constituents of floc which is subsequently removed by settling and filtration. The fluorides might be removed by the formation of an aluminum fluoride complex or by adsorption on the floc. In addition to the fluoride removal characteristics of the aluminum compounds, they are relatively inexpensive, easy to use, and can be combined advantageously with aids to coagulation

such as clays and activated silica. The results reported on the effectiveness of aluminum hydroxide floc formed from aluminum sulphate and a source of alkalinity vary considerably. The variations can be attributed to such factors as the following: different raw waters with varying induced fluoride concentrations were used; the speed of adding the reagent and methods of mixing were different<sup>12</sup>; the times of contact varied; the pH was not the same; and, not all of the effluents were filtered. In general, however, 4.0 p.p.m. fluorides are removed from water when hydrous aluminum sulfate is used in concentrations of 335 p.p.m.,<sup>11</sup> 430 p.p.m.,<sup>34</sup> or 513 p.p.m.<sup>47</sup> According to one investigator, it required 891 p.p.m. aluminum sulfate to reduce fluorides from 6.0 to 1.0 p.p.m.<sup>47</sup> while according to another<sup>34, 35</sup> 860 p.p.m. were required to obtain a reduction from 8.5 to 1.0 p.p.m. In order to obtain maximum fluoride reductions, optimum hydrogen ion concentration is necessary but the pH can be controlled in treatment plants by adjusting the chemical feeders.

Fluoride removal experiments in which aluminum sulfate and coagulation aids (clays and activated silica) were used together with alkalin solutions for pH control, were conducted recently in the Industrial Hygiene Laboratories at the National Institute of Health and in pilot plants at Great Falls, Md. (Potomac River raw water), and at Cincinnati, Ohio (Cincinnati City water).<sup>39</sup> Fluoride concentrations<sup>10</sup> were determined by using the Scott modification<sup>48</sup> of the Sanchis procedure<sup>40</sup> and the Lamar adaptation<sup>30</sup> with a spectrophotometer. The results with the conventional type of plant at Great Falls (mixing, flocculation, settling, and filtration) indicated that fluorides can be reduced in two steps (6.0 to 3.5 p.p.m. and from 3.5 to 1.0 p.p.m.) using in each step 100 p.p.m. aluminum sulfate, 100 p.p.m. clay, and

about 25 p.p.m. lime. In an improvised experimental sludge-blanket type plant (precipitator) in Cincinnati approximately 25 per cent more fluorides were removed using the same chemical dosages as at Great Falls. When activated silica (Baylis Sol) was used in conjunction with alum, clay, and soda ash, a further reduction in fluorides was noted.<sup>4, 5, 6, 32, 33</sup> Based on the quantities of chemicals used in the conventional pilot plant the cost is estimated to be about \$35 per m.g. The process is not as efficient with highly mineralized ground water in which excessive fluorides are naturally present. The reason for decreased efficiency under the latter conditions is not known.

Another method utilizing aluminum salts involves contact beds of insoluble material impregnated with aluminum compounds. The earliest report<sup>43</sup> suggested soaking filter beds of sand or diatomaceous earth with the precipitated hydroxide of aluminum sulfate and an alkali. The data available on the fluoride removal efficiencies of this method are not sufficient to serve as a basis for estimating costs.

A similar method involves pickling base exchange materials<sup>54</sup> (natural or synthetic zeolites) or naturally adsorptive materials<sup>55</sup> in aluminum salt solutions. Although these pickling solutions are highly concentrated, five hours of contact are required before the exchange material has been converted to an anion exchange compound. The aluminum ion is presumed to have entered into the chemical structure of the material and reversed its exchange mechanism. When the bed is exhausted, it can be regenerated with soluble aluminum salts. This method is the least efficient of those in which aluminum soaking is involved.<sup>44</sup>

Another method involving aluminum salts and utilizing contact beds is based on the formation of insoluble compounds in the presence of excess aluminum ions. The insoluble compounds thus formed

are alleged to possess a fluoride removal capacity several times that of materials of the base exchange group. The superior performance is attributed to the much higher concentration of aluminum salts in solution and to the concomitant increase in adsorbed uncombined aluminum ions.<sup>56</sup> The insoluble compounds can be made from either sodium silicate, barium chloride, sodium phosphate, ferrous sulfate or titanium chloride in the presence of excess aluminum salts. The precipitates formed are washed, dried and graded. Regeneration is accomplished by washing the bed with solutions of either aluminum salts or dilute mineral acids or alkalis. No data are available on the fluoride-removing capacity of this method or of its efficiency after repeated regenerations. Until other commercial uses can be found for the insoluble materials used in this method, their cost for fluoride removal will probably be too high for use in municipal installations.

Dehydrated aluminum oxide (calcined alumina)<sup>15</sup> or partially hydrated alumina<sup>31</sup> have been suggested for use in contact beds. The calcined alumina (activated alumina) has been tried in field tests<sup>29, 52</sup> and rated as fairly good with respect to fluoride removal efficiency. When the bed becomes exhausted the fluorides are removed by washing with a dilute caustic solution and neutralized with a dilute acid solution. Chemicals for regenerating the materials used in this method amount to \$275 per m.g. Because tricalcium phosphates have a better removal capacity and a lower regeneration cost than activated alumina, the latter is no longer advocated for municipal treatment plant use.

Other hydrated metallic oxides have also been suggested for removing fluorides. These include ferric oxide, chromium borate, mixed oxides of iron and manganese, bauxite and bog iron ore. All can be regenerated to varying

degrees but ferric oxide is probably the most efficient.<sup>31</sup> Using caustic soda and carbon dioxide solutions for regeneration, chemicals cost approximately \$250 per m.g.

#### ION EXCHANGE PROCESSES

While the compounds which are subjected to aluminum solution soaking probably involve a combination of ion exchange and adsorption principles in fluoride removal, several additional products are claimed to involve predominately ion exchange processes. One of these is made from barium or ferric chloride and silicic acid with the formation of a complex metal chloride silicate. It is claimed<sup>53</sup> that the fluorides are removed from water when in contact with this material by exchange with the chloride ions. Regeneration of the materials has not been advocated and no data are available on capacities or costs. Another compound is obtained from asphaltic materials heat treated with an alkali.<sup>57</sup> Fluorides are presumed to be removed by anion exchange with the hydroxide. Regeneration is accomplished with an alkali but capacities and costs have not been determined.

Recently an organic resinous anion exchange material made from various diaminobenzenes or phenols and formaldehyde has been announced.<sup>45</sup> It is alleged that this material is somewhat selective for fluorides, removing in addition only iron, copper or other metals yielding insoluble hydroxides.<sup>44</sup> The material is first conditioned with a 4 per cent soda ash solution, neutralized with a dilute acid wash (500 p.p.m. hydrochloric acid) and then soaked with a 4 per cent solution of aluminum sulfate. The exchange capacity is based on 1,240 grains of fluorides per cu. ft. Chemical costs for regeneration amount to about \$90 per m.g. Further tests on this material to determine the effect of higher concentrations of radicals commonly found in ground waters and the

possibility of utilizing other regenerating chemicals are now in progress.

#### OTHER METHODS

The use of lime for fluoride reduction was known soon after the cause of fluorosis was discovered.<sup>11</sup> In a study of the results of lime softening plants in Ohio,<sup>47</sup> it was determined that fluoride reduction with lime was actually a function of the amount of magnesium removed. When waters were fluorinated with sodium fluoride and treated with magnesia, it was demonstrated that the magnesia first becomes partially hydrated, then magnesium fluoride and sodium hydroxide are formed by metathesis and finally the magnesium fluoride is attached to the magnesia, forming perhaps an oxyfluoride.<sup>61</sup> The results of samples examined from the softening plants indicated that the quantity of fluorides removed approximately equaled the product of 7 per cent of the initial fluoride and the square root of the amount of magnesium removed. Between 45 and 65 p.p.m. magnesium must be removed to reduce the fluoride one p.p.m. Theoretically, if a residual fluoride of 1.0 p.p.m. is desired, 100 p.p.m. magnesium must be removed if the initial fluoride content is 3.3 p.p.m. A magnesium concentration of this magnitude is rare in most high fluoride waters. Consequently employment of this method would involve the addition of magnesium preferably in the form of dolomitic lime, calcined magnesite or activated magnesia.<sup>9, 26, 27</sup> For average waters containing 6.0 p.p.m. fluoride and relatively high magnesium (20 p.p.m.), about eight tons of chemicals would be required per m.g. (carbon dioxide for pre- and post-carbonation, dolomitic lime and aluminum sulfate). The chemical costs would aggregate \$120 per m.g. Despite this relatively high cost and the large quantities of chemicals required (involving principally

sludge disposal problems), this method appears to be particularly applicable in the treatment of hard waters which require softening and which contain less than 4.0 p.p.m. fluorides. A refinement of this process provides a source of carbon dioxide for pre-carbonation,<sup>9</sup> which is necessary to convert the magnesia to magnesium carbonate. The carbon dioxide is produced from conversion of bicarbonates by passing the water through hydrogen exchange materials.

Other chemicals and processes have been reported, many of which proved to be ineffective or impracticable. Activated carbon is quite efficient and its use is based on sound chemical principles.<sup>42</sup> Almost complete fluoride removal is possible, however, only when the pH of the raw water is less than 3.0. No fluoride is removed at a pH of 8.0 or higher. Regeneration is possible with weak alkaline and acid solutions although no reports have been made as to the removal capacity of the carbon after repeated regenerations.

About one-half the fluorides originally present in water are removed using dosages of approximately 2,000 p.p.m. of either Wyoming bentonites, Fuller's earths, celite, or silica gel. To obtain this removal, however, the pH of the raw water is reduced to 2.5. In no case is any fluoride removed when the pH of the water is 8.3.<sup>41</sup> Because of the inefficiency of these materials and their pH requirements their use is impracticable for fluoride removals.

#### SUMMARY AND CONCLUSIONS

More than a million persons in over 500 communities in the United States are now using public water supplies containing in excess of 1.5 p.p.m. fluorides. The disfiguring dental condition which is caused by the use of such waters for drinking purposes can be prevented in future populations of these communities by removing the excess fluo-

rides from the communal water supplies.

Most of the removal processes now available appear to be either too expensive to operate or too complicated for routine application by the average small water treatment plant operator. An urgent need is the development of a process comparable to the lime-soda ash softening process in operating costs and simplicity.

The problem of choosing the most practical method of defluorination for a particular supply is difficult, because of the almost complete absence of operational data. The choice of method for the accomplishment of a similar purpose as in other treatment processes, depends, by and large, on the rate of water consumption and on the characteristics of the raw water. For large municipal plants which treat waters requiring a reduction in hardness, it is advisable, in general, to reduce the fluorides as much as possible by the lime softening process. In some cases it would be economical to balance the costs of pre-carbonation and sludge disposal against the addition of a limited quantity of magnesium compounds. Excess fluorides remaining after this process could be removed in gravity contact filters or by an aluminum-clay floc, with subsequent separation of the floc from the water.

In small plants where softening is not desired, pressure contact filters appear to be more economical. Where the water is hard, lime softening is indicated up to a raw water fluoride content of about 4.0 p.p.m. If the fluoride exceeds this figure in hard waters, the remaining fluorides can be removed by contact filters.

The tricalcium phosphates and the resinous ion exchangers, when used in contact filters, appear to have the highest exchange capacities for fluorides. Furthermore, the chemical cost for regeneration of these materials is relatively economical.

It is evident from this examination of fluoride removal methods that our current knowledge of the chemical processes involved is very limited and that additional fundamental research in this field is needed. Further, the practical usefulness of the available methods and those now undeveloped must be tested on a pilot plant scale, and their relative worth under varying conditions must be determined. Until this information is available, endemic fluorosis will continue to be a dental hazard to a large population in many communities in this country.

#### REFERENCES

1. Adler, H., Klein, G., and Lindsay, F. K. Removal of Fluorides from Potable Water by Tricalcium Phosphate. *Indust. & Engin. Chem.*, 30:163 (Feb.), 1938.
2. Adler, Howard. U. S. Patent 2,262,745 (Nov. 18), 1941.
3. ———. U. S. Patent 2,417,462 (Mar. 18), 1947.
4. Baker, C. L., and Dedrick, C. H. U. S. Patent 2,310,009 (Feb. 2), 1943.
5. Baylis, J. R. Silicates as Aids to Coagulation. *J. Am. Water Works A.*, 29:1355 (Sept.), 1937.
6. ———. U. S. Patent 2,217,466 (Oct. 8), 1940.
7. Behrman, A. S., and Gustafson, H. Removal of Fluorine from Water. A Development in the Use of Tricalcium Phosphate. *Indust. & Engin. Chem.*, 30:1011 (Sept.), 1938.
8. ———. U. S. Patent 2,227,432 (Jan. 7), 1941.
9. ———. U. S. Patent 2,376,897 (May 29), 1945.
10. Black, A. P., Chairman of Committee on Methods of Determining Fluorides. *J. Am. Water Works A.*, 33:1965 (Nov.), 1941.
11. Boruff, C. S. Removal of Fluorides from Drinking Waters. *Indust. & Engin. Chem.*, 26:69 (Jan.), 1934.
12. Boruff, C. S., Buswell, A. M., and Upton, W. V. Adsorption of Fluorides from Salts by Alum Floc. *Indust. & Engin. Chem.*, 29:1154 (Oct.), 1937.
13. Burwell, A. L., Case, L. C., and Goodnight, C. H. Fluoride Removal from Drinking Water. *Okla. Geo. Survey Cir.*, 25, 1945.
14. Churchill, H. V. Occurrence of Fluorides in Some Waters of the United States. *Indust. & Engin. Chem.*, 23:996 (Sept.), 1931.
15. ———. U. S. Patent 2,059,553 (Nov. 3), 1936.
16. Dean, H. T., and Elvove, E. Studies on the Minimal Threshold of the Dental Sign of Chronic Endemic Fluorosis (Mottled Enamel). *Pub. Health Rep.*, 50:1719 (Dec. 6), 1935. Repr. 1721.
17. ———. Some Epidemiological Aspects of Chronic Endemic Dental Fluorosis. *A.J.P.H.*, 26:567. (June), 1936.
18. ———. Further Studies on the Minimal Threshold of Chronic Endemic Dental Fluorosis. *Pub. Health Rep.*, 52:1249 (Sept. 10), 1937. Repr. 1857.



19. Dean, H. T. Endemic Fluorosis and Its Relation to Dental Caries. *Pub. Health Rep.*, 53:1443 (Aug. 19), 1938. Repr. 1973.
20. Dean, H. T., McKay, F. S., and Elvove, E. Mottled Enamel Survey of Bauxite, Arkansas. Ten Years After a Change in the Common Water Supply. *Pub. Health Rep.*, 53:1736 (Sept. 30), 1938. Repr. 1989.
21. Dean, H. T., Elvove, E., and Poston, R. F. Mottled Enamel in South Dakota. *Public Health Rep.*, 54:212 (Feb. 10), 1939. Repr. 2032.
22. Dean, H. T., Jay, P., Arnold, F. A., Jr., McClure, F. J., and Elvove, E. Domestic Water and Dental Caries Including Certain Epidemiological Aspects of Oral *L. Acidophilus*. *Pub. Health Rep.*, 54:862 (May 26), 1939. Repr. 2073.
23. Dean, H. T., and McKay, F. S. Production of Mottled Enamel Halted by a Change in Common Water Supply. *A.J.P.H.*, 29:590 (June), 1939.
24. Dean, H. T., Jay, P., Arnold, F. A., Jr., and Elvove, E. Domestic Water and Dental Caries. *Pub. Health Rep.*, 56:761 (Apr. 11), 1941. Repr. 2260.
25. Eager, J. M. Denti di chiaie. *Pub. Health Rep.*, 16:2576 (Nov. 1), 1901.
26. Elvove, E. Removal of Fluoride from Water. *Pub. Health Rep.*, 52:1308 (Sept. 17), 1937. Repr. 1860.
27. Elvove, E. U. S. Patent 2,207,725 (July 16), 1940.
28. ———. U. S. Patent 2,257,111 (Sept. 30), 1941.
29. Fink, G. J., and Lindsay, F. K. Activated Alumina for Removing Fluorides from Drinking Water. *Indust. & Engin. Chem.*, 28:947 (Aug.), 1936.
30. Goodwin, R. C., and Litton, J. B. Removal of Fluorides from Public Water Supplies. *Indust. & Engin. Chem.*, 33:1046 (Aug.), 1941.
31. Goetz, P. C. U. S. Patent 2,139,227 (Dec. 6), 1938.
32. Hay, H. R. Water Purification Methods Involving Sodium Silicates. *J. Am. Water Works A.*, 36:626 (June), 1944.
33. ———. Improving Water Plant Operation with Activated Silica. *Water & Sew. Works*, 93:353 (Sept.), 1946, and 93:389 (Oct.), 1946.
34. Kempf, C. A., Greenwood, D. A., and Nelson, V. E. The Removal of Fluorine from Drinking Waters in the State of Iowa. *J. Iowa Acad. Science*, 41:153, 1934.
35. Kempf, C. A., Galligan, W. E., Greenwood, D. A., and Nelson, V. E. Studies on the Removal of Fluorine from Drinking Waters in the State of Iowa. *J. Iowa Acad. Science*, 43:191, 1936.
36. Lamar, W. L. Determination of Fluorine in Water. *Indust. & Engin. Chem., Anal. Ed.*, 17:148 (Mar.), 1945.
37. MacIntire, W. H., and Hammond, J. W. Removal of Fluorides from Natural Waters by Calcium Phosphates. *Indust. & Engin. Chem.*, 30:160 (Feb.), 1938.
38. MacIntire, W. H. U. S. Patent 2,126,793 (Aug. 16), 1938.
39. Maier, F. J. Unpublished Data.
40. McKay, F. S. Mottled Enamel: The Prevention of Its Further Production Through a Change of Water Supply at Oakley, Idaho. *J. Am. Dent. A.*, 20:1137 (July), 1933.
41. McKee, R. H., and Johnston, W. S. Removal of Fluorides from Drinking Water. *Indust. & Engin. Chem.*, 26:849 (Aug.), 1934.
42. ———. U. S. Patent 2,072,376 (Mar. 2), 1937.
43. Meinzer, G. H. U. S. Patent 2,043,705 (June 6), 1936.
44. Myers, R. J., and Herr, D. S. U. S. Patent 2,373,632 (Apr. 10), 1945.
45. Resinous Products and Chemical Co., *Ambrelite Bul.*, 1946.
46. Sanchis, J. M. Determination of Fluorides in Natural Waters. *Indust. & Engin. Chem., Anal. Ed.*, 6:134 (Mar.), 1934.
47. Scott, R. D., Kimberly, A. S., Van Horn, A. L., Ey, L. F., and Waring, F. H. Fluoride in Ohio Water Supplies—Its Effect, Occurrence and Reduction. *J. Am. Water Works A.*, 29:9 (Jan.), 1937.
48. Scott, R. D. Modification of Fluoride Determination. *J. Am. Water Works A.*, 33:2018 (Nov.), 1941; 34:522 (Apr.), 1942.
49. Smith, M. C., Lantz, E. M., and Smith, H. V. The Cause of Mottled Enamel, A Defect of Human Teeth. *Univ. of Ariz. Exp. Sta., Tech. Bull.*, 32, 1931.
50. Smith, H. V., and Smith, M. C. Bone Contact Removes Fluorine. *W. W. Eng.*, 90:1600 (Nov. 10), 1937.
51. ———. U. S. Patent 2,380,800 (July 31), 1945.
52. Swope, H. G., and Hess, R. H. Removal of Fluorides from Natural Waters by Defluorite. *Indust. & Engin. Chem.*, 29:424 (Apr.), 1937.
53. Urbain, O. M., and Steman, W. R. U. S. Patent 2,157,509 (May 9), 1939.
54. ———. U. S. Patent 2,210,965 (Aug. 13), 1940.
55. ———. U. S. Patent 2,210,966 (Aug. 13), 1940.
56. ———. U. S. Patent 2,268,971 (Jan. 6), 1942.
57. ———. U. S. Patent 2,309,366 (Jan. 26), 1943.
58. Van Burkalow, A. Fluorine in United States Water Supplies. *Geo. Rev.*, 36:177 (Feb.), 1946, and recent unpublished data from Am. Geo. Soc.
59. Velu, H. Dystrophie Dentaire des Mammifères des Zones Phosphates (Darmous) et Fluorose Chronique. *Compt. rend. Soc. de Biol.*, 58:750 (Nov.), 1931.
60. Wamsley, R. and Jones, W. E. Treatment of Mine Water for Domestic Use. *Tech. Pub. 1913*, A.I.M.E. (Nov.), 1945.
61. Zettlemoyer, A. C., Zettlemoyer, E. A., and Walker, W. C. Active Magnesia. II. Adsorption of Fluoride from Aqueous Solution. *J. Am. Chem. Soc.*, 69:1312 (June), 1947.

# Problem Drinking—A Public Health and Municipal Responsibility\*

LYMAN C. DURYEA, M.D., M.P.H., F.A.P.H.A.

*Medical Director, The Research Council on Problems of Alcohol, New York, N. Y.*

## INTRODUCTION

*Nature of a public health problem—*What constitutes a public health problem? Surgeon General Thomas Parran some years ago formulated the following definition: "Whenever a disease is so widespread in a population," he said, "so serious in its effects, so costly in its treatment that the individual cannot deal with it himself, it becomes a public health problem." Problem drinking fits every facet of this definition.

Alcoholism, or problem drinking as we prefer to call it, is a matter of public concern "whose health features," according to Dr. Lawrence Kolb, former Assistant Surgeon General, U. S. Public Health Service, "have been obscured by social and legal factors."

*Problem drinkers as a public health problem—*Regardless of our personal convictions regarding the use of alcoholic beverages and of our reactions to the manifestations of excessive drinking—drunkenness (and regardless of the causative factors underlying the drinking compulsion)—the fact remains that when one once becomes an uncontrolled drinker he is a sick person.

Acute alcoholic intoxication is a medical condition requiring medical care just as is intoxication from barbiturates voluntarily taken for insomnia or tension. Yet we accept for treatment in

our hospitals barbiturate intoxicants, but refuse hospital treatment to the alcoholic who is acutely ill or in a stage of exacerbation of a chronic illness. Dr. E. M. Bluestone, Director, Montefiore Hospital, New York, in the foreword to the American Hospital Association report on *Institutional Facilities for the Treatment of Alcoholism* said, "The medical profession has been so absorbed in the pressing problems of other diseases that they have played into the hands of a sanctimonious group in our midst, who would have such patients stew in their own juice, and who have no sympathy for a scientific medical approach to this peculiarly baffling malady," and I might add even as they had for years regarding victims of the mental and venereal diseases.

A tour through the "Skid Rows" of our cities, which include the Bowery in New York City, will remind one of the Russia of a century ago described by Tolstoy, a time when there were few asylums or hospitals for the mentally ill and nearly everyone had a neighbor with some mental disorder. These people were part of the landscape as our inebriates on the skid rows and the boweries of the cities of our country are today. At the present time, in this country, through the efforts of the medical profession and as a result of the demand of an enlightened public, most of the mentally ill have been removed from the streets and provided

\* Address delivered at the annual Conference of the Health Officers and Public Health Nurses Association, Saratoga, N. Y., July 30, 1947.

with facilities and treatments undreamed of but a few years ago. This is not true of the alcoholic.

How many of us are there who do not know some really worth while person who occasionally or frequently drinks to excess—with resultant familial and economic problems? How many of us have not thought of chronic drinkers at times as annoying drunks or stumble-bums? But what was our attitude toward venereal disease not so long ago? The alcoholic, the problem drinker, remains the only diagnostic entity for whom we provide few or no facilities for treatment. This is the only condition requiring medical attention whose victims are treated as criminals and remanded to jails through court action. As Dr. Ray Lyman Wilbur, Chancellor of Stanford University, stated in a recent communication to me, "Our whole set-up for rehabilitation of the drunkard is imperfect and often vicious. From the time he is picked up by the patrol, passed from the jail to the police judge, and from there on, there is constant failure to meet the situation. We must go back and get some fresh starts in our thinking. Our newspapers, the public in general, our courts, our doctors and social workers, all seem to me to have the wrong approach to this question. Fundamentally, the chronic drinker is a problem for the doctor. It is evident that we shall need to give special training and provide special facilities if we are to accept the use of alcohol and its public distribution as part of our so-called civilization."

The problem drinker is a sick individual, whether he is suffering from some physiological deficiency, whether he was emotionally sick previous to his excessive drinking, or whether he is socially maladjusted. He is as much sick because of the causes of his drinking as because of the end-products of it.

Problem drinking is not a specific disease as is malaria. Rather it is a con-

dition presenting a multiplicity of symptoms, the most predominant of which is excessive drinking. So far there is no accurate scientific analytical definition of what problem drinking actually is. It is a problem on which there is more misinformation than information. We see a symptom of the disease, drunkenness. We recognize a drunkard but cannot define in scientific or legal terms the absolute character of his condition, nor what causes him to be a drunkard, nor why he cannot stop drinking once he has started, nor what changes take place in this individual which result in an uncontrollable and insatiable desire for more alcohol.

Chronic drinking is a matter of concern to us all, not merely because of its unknown elements, its neglect in social terms, its waste, but also because of its magnitude. In many communities it exceeds tuberculosis. It is a public health problem because of the number of people involved, the inability of the individual or his family to cope with it, and finally because of its effect on our society.

*Extent of the problem*—It has been estimated that 57 per cent of the male population and 29 per cent of the female population between the ages of 15 and 60 years use alcoholic beverages. This is 44 per cent of the entire population in this age group. The total estimated number of excessive drinkers is 3,750,000, or approximately 6 per cent of the drinking population. Of these, 750,000 may be considered problem drinkers. The prevalence of intemperate drinking is estimated to be between 2.5 per cent and 3 per cent of the adult male population, and there are estimated to be 6 times as many men as women among heavy drinkers. It may be concluded conservatively from these figures that problem drinking is of considerable magnitude.

The urban-rural breakdown has been recently estimated by Dr. E. M. Jellinek

of Yale University. His estimates for chronic alcoholism are as follows:

In cities with a population of 100,000 or over.....	972 per 100,000
In cities with a population of 10,000 to 100,000.....	727 per 100,000
In cities with a population of 2,500 to 10,000.....	743 per 100,000
Rural (less than 2,500).....	474 per 100,000

New York State ranks third throughout the country with an estimated chronic alcoholic rate of 1,034 per 100,000 of population. This is an increase of 34.3 per cent over the rate of 770 per 100,000 in 1930 when New York ranked eighth. In Albany, N. Y., for example, in 1940, the latest year for which rates are available, the rate was 725 per 100,000.

These figures may be considered as reliable estimates with the possibility of variations, plus or minus. The sources of these estimates and the indices by which they are arrived at cannot be regarded as accurate statistical data. Many of us in this field, however, regard the estimates as representing the "least possible number."

#### PRESENT-DAY HANDLING OF THE PROBLEM

*Hospital facilities*—In the foreword to the American Hospital Association's report *Institutional Facilities for the Treatment of Alcoholism*, Dr. E. M. Bluestone said, "The false spirit of humor which unhappily surrounds the alcoholic patient and endows him with a certain grotesqueness, and the stigma which is fastened upon him to his lasting disadvantage, combine to withhold, from the sick man that he is, the medical care that is his right and privilege. Most of our hospitals have thus far failed to dignify alcohol addiction as a disease worthy of study and intensive care. Every kind of patient has been provided for, in one type of hospital or another, including the leper whose traditional position as an outcast has not

deflected us from planning for his care. The problem (of alcoholism) demands the aid of the best medical brains and the use of the facilities of every hospital. Doctors and hospitals have, however, maintained a hands-off policy toward the alcoholic patient which is practically universal. Yet every forward move in medical and hospital progress points invitingly to the solution of this problem. There must be a scientific solution to this problem, without resort to extreme measures, and our general hospitals are peculiarly situated to take the lead because they enjoy the best in medical talent, investigative facilities, and educational arrangements."

More recently, the New York Academy of Medicine, under a grant from the Research Council on Problems of Alcohol, found that, "while it is true the majority of the reporting physicians do not treat alcoholism, this does not reflect a lack of interest in this problem on the part of the medical profession but rather a feeling of futility and a realization that specialized knowledge is required to deal effectively with the various phases of it." The Academy of Medicine also found that, "in New York City neither the voluntary hospitals, except one, nor the proprietary institutions of various kinds, except one, have made provision for the treatment of alcoholic patients. The institutions which take alcoholics treat them only during the acute stage.

"Since the number of alcoholics treated in New York in voluntary hospitals and proprietary institutions, as well as in private practice, is apparently small, it remains an enigma as to where and by whom the purportedly large contingent of alcohol addicts is being treated. The conclusion that they receive little attention seems justified." Meager as is the *municipal* hospital care of problem drinkers, "New York is one of the few cities in the United States

in which the treatment of alcoholism is regarded as a hospital and not primarily a police problem." This is the view of the officials of the City of New York.

In general, however, the patient suffering from chronic drinking is too often consigned to the police or, still worse, left to his own devices without constructive aid from doctors or hospitals unless he is a man of wealth, in which case he can obtain care of a palliative sort. If he is poor he is doubly cursed. In his inability to cope with his problem himself he gets kicked around not only by society but by those of us who in our hearts should know better. We must not lull ourselves into believing we can dispose of the problem by pleading that we have other work to do for those whom we consider more deserving. Who is to select the most deserving in our midst?

*The jail*—Despite the emerging concept that problem drinking is a symptom of complex, little understood, causative factors and that it is a medical problem requiring medical care, intoxication and problem drinking generally are legally considered practically as criminal offenses. Problem drinkers, in acute exacerbation, and episodic or occasional acute alcoholics, usually come before the courts. In most of our local jails problem drinkers and episodic drunks constitute 50–60 per cent of their population. They have become in effect chronic disease hospitals, for which they are neither staffed, equipped, nor originally constituted.

Although increasingly more and more jurists and penologists are becoming aware of the medical nature and needs of problem drinkers, they are at a loss as to how to handle the problem. One of them recently remarked to me, "I am aghast at the seriousness of this problem. I don't want to send these men to jail, where they will receive no treatment and from which they will emerge to repeat the cycle of intoxica-

tion and commitment over and over with harm to themselves, their families, and the community. But what can I do with them? There is needed constructive, municipal planning to provide for adequate case finding, treatment, prevention, and rehabilitation."

These might have been the words of a health officer instead of a lawyer. That such planning is little in evidence at this time needs no further restatement, nor that the need for it is great; yet many problem drinkers could be saved, if in the early stages of their chronic drinking they were handled like sick people instead of being treated like criminals or allowed to shift for themselves. They are serious problems for the police, the courts, and the welfare agencies; serious problems, in the main, poorly handled. They are an economic deadweight on society. Yet, on the basis of economics alone, they are worth helping. Take one group alone, Alcoholics Anonymous, many of whom had hit the bottom rung of the medical, social, and economic ladder. Their present membership has an annual estimated earning capacity of \$150,000,000.

#### MUNICIPAL RESPONSIBILITY

The effects of problem drinking on the security, productivity, and stability of our communities can be measured by a number of factors. The incidence of disease among these people is high. Their accident rates in the factory, the shop, and the home are abnormally high. Their rates of absenteeism and turnover and unemployment are marked. Their marriage rate is lower. Their divorce rate is higher. Eighty to 90 per cent of the population of municipal and private shelters comprise problem drinkers. The damaging and frightening effects of problem drinking spread out and affect the child of the alcoholic parent, the wife, the brother, the employer or the employee.

Private agencies by themselves cannot

be expected to cope with problems as numerically large and cross-sectional as these. These are clearly in the public domain. As a public liability, they are a public responsibility. Only within recent years has government taken action to meet these problems squarely. At the present time eight states have official commissions on alcoholism. Many local communities are likewise taking official action to explore and meet these problems.

In the State of Connecticut certain funds have been set aside to be used for the study, treatment, and care of problem drinkers. Other states and communities are proposing to establish facilities for problem drinkers. There is much confusion, however, in the minds of interested people in communities as to how to prepare laws and legislation relative to the handling of problem drinkers. Unless guidance is forthcoming from the medical profession and public health officials, it is possible that large amounts of public funds will be injudiciously allocated and expended without knowledge of the actual needs and without proper consideration of public health procedures necessary to cope with the problem.

The New York Academy of Medicine Survey of facilities for the Care and Treatment of Alcoholics reported: "A feeling of frustration seems to prevail in the attitude of most of the social agencies. Neither the Welfare Council of the City of New York nor the Mental Hygiene Committee of the State Charities Aid Association, nor any other similar agency has developed any constructive program as to methods of dealing with the problem."

The Chief Magistrate points out that the "whole subject of alcoholism, particularly in its relationship with penal sanctions and their enforcement by the courts, needs a thorough overhauling and an approach not yet adequately undertaken, together with provisions for

facilities of substantial and permanent character. He stresses the lack of adequate facilities for the treatment of alcohol addicts and says that without some medium, such as a farm colony where large numbers of cases could be assembled for a scientific approach to the problem, the courts are helpless to deal with the problem in a constructive manner.

"The Department of Education of New York City is frequently faced with the effect of parental alcoholism on the behavior and attendance of the students. The Bureau of Child Guidance of the department has to meet as best it can the problems arising among children coming from homes where one or both parents are chronic alcoholics. These children present all kinds of problems from aggressive behavior to truancy and delinquency.

"The Division of Vocational Rehabilitation of the New York State Education Department has given a great deal of thought to the rehabilitation of alcoholics. It accepts this group for vocational rehabilitation and pursues a policy of studying individual cases with regard to the cause and type of alcoholism—whether it is chronic or intermittent, and the like. It is guided, to a considerable extent, by the medical information that is secured from the individuals' physicians. The division, however, has not as yet developed any special training facilities for alcoholics but it reports that it is in a position to arrange for psychiatric treatment for some of them where the medical information indicates a favorable prognosis.

"The City Health Department recognizes alcoholism as a matter of public health concern but has never had funds for the establishment of a program to deal with it. In writing to the committee Dr. Ernest L. Stebbins, the former Health Commissioner, expressed his judgment that alcoholism should be regarded as a public health problem, and

that it should be possible . . . 'to approach the problem through agencies providing public health education, the establishment of diagnostic clinics affiliated with a referral agency, and the provision of adequate alcoholic treatment centers with facilities for follow-up care.'"

A disease, whose ravages affect not only its victim, but all who are dependent upon him or in close contact with him, is clearly the concern of public health and municipal authorities. The cost of the disease to society is staggering. From 25 to 28 per cent of all crimes are estimated to be associated with alcohol. The costs to society of merely confining and punishing the alcoholic run to millions of dollars a year. According to statistics cited by Dr. George S. Johnson, Professor of Neuro-Psychiatry at Stanford University School of Medicine, alcoholic psychoses accounted for 4.5 per cent of all first admissions to hospitals for mental disease in 1938. An additional 6.9 per cent were patients suffering from alcoholism without psychosis. Arrests for drunkenness throughout the nation range from about 1,000 to 3,000 per 100,000 population. All deaths involving alcoholism as primary or secondary cause accounted for one of every 200 of total deaths for the year 1940. Prisons, hospitals, mental institutions, social agencies, would be relieved of a heavy load if alcoholism could be wiped out, as smallpox and the black plague have been wiped out. The cost to society in terms of human lives, human misery, broken homes and broken hearts resulting from alcoholism cannot be estimated.

Education on alcohol is required by law in all the elementary schools and most of the high schools of this country. However, a recent survey indicates that the content as regards alcohol education is unsatisfactory. This has happened because by far the largest part

of the course material used by writers of textbooks has come not from scientific sources, but directly or indirectly from lay groups with a specific interest. The teaching is reported to reflect anxiety that objective scientific presentation of the subject might frustrate the aims tacitly incorporated in the statutes which require education in alcohol, namely prohibition. There is required a revision of education with regard to alcohol, a clearing away of all inaccurate statements and misconceptions and the development of sound information and instruction so that one may see the problem of alcohol as aspects of the hygiene of the individual and of the society in which he lives.

#### SUMMARY

Health officers can play an effective rôle in assisting our local governments in the resolution of the problems of problem drinking. As health officers, as well as educators, they can encourage the people of their communities to recognize the medical nature of problem drinking. They can insist that the departments of education not only present this point of view but also utilize only objective, scientific publications on problem drinking. The health officers can impress upon their communities the wisdom, measured in medical, social, and economic terms, of utilizing and developing medical instead of penal institutions for the care of problem drinkers. Over and beyond the need for the institution of service, is the abounding need for medical facilities in which continuing research may be undertaken into the character and causes of problem drinking, effective means of treatment and prevention.

Within the framework of their local departments of health, health officers can supply a long neglected need in encouraging demographic studies of problem drinking. The data coming out of these studies are essential to the shaping

of any intelligent, long-range, community program. As much in their capacity as physicians, as in their official rôles as health officers, they can encourage agencies of government to recodify the law with a view of making

problem drinkers the charge of health agencies rather than penal agencies. And, finally, health officers can be of inestimable value in guiding legislators to develop the kind of laws necessary to cope effectively with this problem.

Best Sellers in the Book Service for November

American Illustrated Medical Dictionary. Dorland. 8th ed., 1947.....	\$8.00
indexed.....	8.50
An Appraisal Method for Measuring the Quality of Housing: A Yardstick for Health Officers, Housing Officials and Planners.	
Part I. Nature and Uses of the Method, 1945.....	1.00
Part II. Appraisal of Dwelling Conditions, 1947.....	5.00
The Control of Communicable Diseases, 6th ed., 1945.....	.35
Careers for Nurses. Deming, 1947.....	3.50
Diagnostic Procedures and Reagents, 2nd ed., 1945.....	4.00
Health of the School Child. Cromwell, 1946.....	3.00
Milk and Food Sanitation Practice. Adams, 1947.....	3.25
Public Health Law. Tobey. 3rd ed., 1947.....	4.50
Standard Methods for the Examination of Water and Sewage. 9th ed., 1946.....	4.00
Suggested School Health Policies. 2nd ed., 1945.....	.25

Order from the Book Service  
AMERICAN PUBLIC HEALTH ASSOCIATION



# Alcohol Education— Its Needs and Challenges\*

JOSEPH HIRSH, F.A.P.H.A.

*Associate Director, The Research Council on Problems of Alcohol,  
New York, N. Y.*

THERE are estimated to be 3,750,000 chronic and excessive drinkers in the United States today<sup>1</sup>—roughly seven times the number of tuberculosis patients. The lives of every family, business, or institution are affected by them directly or indirectly. One expert estimates the cost of their unpredictable, uncontrollable drinking to themselves and to society to be *one billion dollars a year*.<sup>2</sup>

The problem drinker is a sick person. Much that is known of his sickness is of relatively recent origin, coming largely from psychiatry.<sup>3, 4, 5</sup> Much is known of his uncontrollable compulsion to drink, viewed by some as the symptom, by others as the cause, and by still others as the process, of his sickness.

The resources of experimental and clinical medicine, of public health and of education must be fully focused on the problem drinker before anything approaching an intelligent understanding and solution to the alcohol problem can be achieved. Critical reports<sup>6, 7</sup> of medicine's lack of leadership in this field have finally evoked a favorable response by the American Medical Association and the American Hospital Association. Similar challenges exist for health educators.

Every state under law requires a specified number of hours of teaching

on the subject of alcohol at the elementary school level and also at the secondary level in all but four states.<sup>8</sup> Such instruction is carried out in general science, biology, and hygiene classes as well as in history, civics, and social studies classes. Though all states require instruction on the effects of alcohol, only a little over half of them make any effort at guiding teachers in the content or the presentation of the subject.

Thirteen states and the District of Columbia\* make available to teachers special study units as a guide to instruction. Independent of state departments of education, the local boards of education of a number of large cities publish special teaching units for their own schools. Ten states† publish courses of study in the health field in which one or more units are devoted to the subjects of drug, narcotic, and alcohol addiction. A half-dozen other states‡ provide teachers with supplementary materials as a guide in developing units of instruction on alcohol.

In the remaining states no guidance is given teachers or students either in terms of suggested units of study or

\* Adaptation of the paper presented before the Public Health Education Section of the American Public Health Association at the Seventy-fifth Annual Meeting in Atlantic City, N. J., October 10, 1947.

\* California, District of Columbia, Florida, Kansas, Maine, Massachusetts, Michigan, Minnesota, Nebraska, New Hampshire, North Carolina, Utah, Vermont, and West Virginia.

† Arizona, Indiana, Mississippi, Missouri, New York, North Dakota, Pennsylvania, South Dakota, Washington, and Wyoming.

‡ Typical of which are Delaware, Iowa, and Ohio.

educational materials. School districts as well as individual schools in these states must rely upon standard textbooks in the health, biology, and physiology fields to provide basic materials to meet the legal requirements. In few, if any, of these states are supplementary materials, devoted entirely to alcohol education, made available or recommended. In other words, almost half of the states requiring alcohol education depend upon oblique and inadequate references to meet the requirements under law.

While the framework for intelligent education of emerging citizens on this important social and public health problem exists in the law in all states, the content of most of the instruction is neither comprehensive nor critical. Part of it is due to poor teacher preparation, part of it to lack of adequate instructional materials.

As an aside, it is both interesting and important to note that in eight states the Woman's Christian Temperance Union workers are specifically authorized to lecture in public schools on this subject. They are also active in the schools of a number of other states. This alone is a challenge to health educators.

Despite the large area of unknown facts more than enough authoritative sources are available for the most critical health educator in the preparation of alcohol education materials. A study of the alcohol literature—books, pamphlets, articles, and papers—almost completed<sup>9</sup> reveals the existence of over 100,000 titles. Close to 80 per cent of them are largely propaganda, for or against alcoholic beverages, using in some cases, more often abusing scientific findings in an effort to make a case for or against alcohol. Twenty thousand titles may be said to constitute the bulk of the objective alcohol literatures. Yet many of these, 30 per cent according to one estimate,<sup>10</sup> are

compilations: 10 per cent are duplications, popularizations, reformulations, or republications. The bulk is therefore reduced to 12,000 titles. Fully half of the 12,000 titles deal with medicolegal, sociological, historical, and administrative problems. The seeker of scientific facts in the literature is therefore left with some 5,500 titles reporting original studies on the biochemical, pathological, physiological, psychiatric, and psychological aspects of problem drinking. Of these, 2,000 are dated and obsolete, leaving 3,500 titles—adequate for some, apparently not enough for most writers and teachers. For a review of the more recent popular books and articles (including health education materials\*) indicates that in their preparation, few, if any, of these select titles were consulted. *Secondary sources and the propagandistic literature apparently were the chief references.* Here then is another issue which health educators cannot leave unchallenged.

Almost half of the textbooks used in elementary and high schools throughout the country in which the problems of alcohol are mentioned, or form an important part, are in the fields of health, hygiene, and physiology (biology). Less than a quarter are in the field of the social studies. The remainder are scattered in a number of other disciplines. To date, there is not a single adequate textbook on the primary or secondary levels or for the general public entirely devoted to this subject in a completely comprehensive and scientific fashion. Nor do the existing texts containing alcohol information fully meet critical requirements.

A number of critical studies have been made of health education texts,<sup>11</sup> physiology and hygiene texts,<sup>12</sup> and

---

\* Health and hygiene books and pamphlets, biology and social studies texts containing references to the alcohol problem.

biology and general science texts,<sup>13</sup> containing alcoholic information. The most comprehensive of these<sup>14</sup> covers a wide variety of elementary and high school textbooks in the aforementioned fields as well as in civics, citizenship, and social studies. After a review of these texts, the author cogently and challengingly comments on the sources of the alcohol material:

The largest part of it comes from publications of temperance organizations . . . (and) such reports by medical men as seemed to offer the best support for the doctrine of total abstinence. The influence of such a publication as the *Syllabus in Alcohol Education* of the Woman's Christian Temperance Union, for example, has been outstanding. Some of the state publications appear to have been largely derived from it. Other publications of the same organization, as well as those of the Scientific Temperance Federation, have also been widely quoted and paraphrased. Apparently few textbook writers have gone to original sources, and even those who quote scientific experiments tend largely to rely upon these other groups to predigest the material for them.<sup>15</sup>

In the interests of science, of truth and of democracy, such a situation is untenable. In order to attack it intelligently, it is important to understand how it came into being.

In the first place, temperance organizations were largely responsible for alcohol education being required by law. That school boards and publishers should have deferred to these organizations in the matter of instruction was a natural though unhealthy consequence. It can no longer remain unchallenged. Furthermore, there has been the frank lack until recently of adequate compilations of scientific source materials for the use of textbook writers. These materials are now becoming increasingly available and it devolves upon the teachers of future teachers and the writers of elementary and secondary textbooks to use these unbiased source materials adequately.

The existing textbook material in the field of alcohol education, derived as it is largely from secondary sources and from sources of valued and restricted judgments inevitably perpetuates stereotypes, moral judgments, errors and conclusions which are often scientifically unjustified. The presentation of the physiological facts in regard to alcohol—the most completely scientific area in this field—leaves much to be desired. As many errors are made concerning the pathologic effects of alcohol upon the body as there are frank misrepresentations of its social effects. The psychology of drinking habits is permeated with casuistic conclusions. Not a single presentation of any facet of this problem is free from criticism. This applies equally to health and hygiene, biology and social science texts.

The responsibility for correction of this situation rests with state and local boards of education who have unquestioningly accepted educational materials of valued judgment, with the colleges neglecting to prepare teachers adequately, with the publishers who accept uncritical textbooks, with the scientists who, until recently, have not made source materials available for the textbook writers and have failed to encourage the preparation of sound educational materials. Finally and most pointedly, the fault lies also with health authorities and health educators who, with few exceptions and until relatively recently, have failed to address themselves to this important public health and educational problem.

While drinking excesses and efforts to control them have been common throughout history, the problems of alcohol as we know them are of recent vintage. During the past two and a half centuries, since the distillation process graduated into an important industry, confusion and controversy have dogged these problems. If equitable solutions are to be achieved and

the problem drinker is to be cared for as a patient, our students through our schools and the public in general must be exposed to new patterns in alcohol education that are sound in fact and unbiased in spirit.

Scientific and medical teachings must replace the moralistic preachments as in other public health problems—the venereal diseases, mental illness, tuberculosis, even cancer—if progress is to be made. The principles of a handful of non-partisan private and public agencies operating in the alcohol field\* may serve as a useful guide.

Alcohol education holds three basic challenges for educators in general and health educators in particular. First, it is a field of ever-increasing knowledge untitled by trained, objective persons. Implicit in it is the solution of a complex socio-medical problem, problem drinking. Second, although it is required teaching under law in practically every public school in the United States, teachers are little prepared to render such instruction. For want of adequately trained personnel and of instructional materials for teachers and students, departments of education in some cases are forced to take what they can get, in other cases actually choose teachers and materials of valued judgment because they have dominated the field so long. Third, many instructional materials are inadequate in content, haphazard in presentation and interpretation, and of limited scientific value.

Health educators and health authorities have a continuing responsibility to address themselves to these challenges and to present the facts about alcohol and its effects in precisely the same terms as they present any other subject—objectively, completely. Anything less necessarily perpetuates errors and falsehoods, delays an intelligent solution of the problem, prolongs half-hearted social action and results in the waste of incalculable thousands of dollars of public funds presently being appropriated for medical and educational programs in this field.

#### REFERENCES

1. Jellinek, E. M. Recent Trends in Alcoholism and in Alcohol Consumption. *Quart. J. Studies on Alcohol*. 8:1 (June), 1947.
2. Landis, B. Some Economic Aspects of Alcohol Problems. *Quart. J. Studies on Alcohol*. Reprint, pp. 59, 1945.
3. Jellinek, E. M. (Editor), *Effects of Alcohol on the Individual*. Vol. 1. New Haven: Yale University Press, 1942.
4. Cushman, J. F., and Landis, C. (Editors) *Studies of Compulsive Drinkers*. New Haven: Hillhouse Press, 1946.
5. Williams, R. C. The Etiology of Alcoholism. *Quart. J. Studies on Alcohol*. 7:567 (Mar.), 1947.
6. Corwin, E. H. L., and Cunningham, E. V. *Institutional Facilities for the Treatment of Alcoholism*. New York: The Research Council on Problems of Alcohol, 1944.
7. The Committee on Public Health Relations of The New York Academy of Medicine. A Survey of Facilities for the Care and Treatment in Alcoholism in New York City. *Quart. J. Studies on Alcohol*. 7:405 (Dec.), 1946.
8. Roe, A. A Survey of Alcohol Education in Elementary and High Schools in the United States. *Quart. J. Studies on Alcohol* 1943.
9. *Op. cit.* 3. Vol. II is to be published in 1948.
10. *Ibid.*
11. Strang, R. *Subject Matter in Health Education*. Contributions to Education. Teachers College (Columbia University). New York. 1926.
12. Tompkins, R. M. *Fifty Years in the Teaching of Physiology and Hygiene in the Elementary Schools*. Masters Thesis, Temple University, Philadelphia. 1935.
13. Raskin, A. *Biology and General Science Textbook Material on the Effects of Alcohol*. Priv. publ., New York. 1942.
14. *Op. cit.* 8.
15. *Ibid.*

\* The Research Council on Problems of Alcohol, Yale Summer School of Alcohol Studies, The National Committee for Education on Alcoholism, and the various state commissions on alcoholism, i.e., Alabama, Connecticut, Oregon, New Hampshire, New Jersey, Utah, and Wisconsin.

# Rural Prepayment Medical Care Plans and Public Health Agencies

MARK ZIEGLER, M.D.,\* E. RICHARD WEINERMAN, M.D.,†  
AND MILTON I. ROEMER, M.D., M.P.H.‡

*Health Services Section, Farmers Home Administration,\*\* Washington, D. C.*

MOST public health workers are acquainted with the medical care program for low-income farm families sponsored since 1935 by the Farm Security Administration.<sup>1</sup> The only federally sponsored activity utilizing the principal of health insurance, this program has provided the nation's most extensive experience in voluntary group prepayment for health services among rural people. The recent changes in agriculture legislation, replacing the Farm Security Administration with the Farmers Home Administration, do not authorize the personnel of the new agency to furnish technical guidance and supervisory assistance to these health service associations. Due to the scarcity of competent leadership among the members of many of these associations, this change will in all probability result in the discontinuance of these groups if assistance from some other source is not forthcoming.

Public health workers in hundreds of rural counties and in most state departments of health are actually in a position to help in the preservation of these group health plans and, at the same time, to increase the effectiveness of their own preventive medical work.

It is to these persons in particular—and to all others concerned with the problems of rural health—that this communication is addressed.

## BACKGROUND OF THE FSA MEDICAL CARE PROGRAM

Organized activities in medical care were first undertaken around 1935 by the Farm Security Administration, as a phase of its general program for rehabilitation of low-income farm families. It was early recognized that poor health and the financial drain of large medical expenses were major reasons for farm failure. Financial plans could be made for most elements of farm and home management, but expenses for medical care could not be budgeted on an individual family basis. Group prepayment into a common fund by all interested FSA borrowers in an area was the obvious answer. Voluntary health insurance plans accordingly became the central feature of the FSA health program. Such prepayment plans were supplemented from time to time by other activities, including: (a) health centers with full-time public health nurses in resettlement projects, (b) farmstead sanitation improvements, (c) financial grants for individual medical emergencies, (d) a specially subsidized demonstration program of comprehensive prepaid medical care in selected counties,<sup>2</sup> (e) health education and

\* Chief Medical Officer, Farmers Home Administration.

† Assistant Chief Medical Officer, Farm Security Administration, from February, 1946, to March, 1947.

‡ Assistant Chief Medical Officer, Farm Security Administration, from March, 1943, to June, 1945.

\*\* Formerly Farm Security Administration.

nutritional programs, and (f) a special public health and medical care program for migratory farm laborers.<sup>3</sup>

Typically, the prepayment plans have been on a county basis with an average membership of 100 to 150 farm families. The scope of services has varied in the different plans, but nearly all have provided the services of general practitioners. Depending on the ability-to-pay of the families in the area, various combinations of surgical services, dental care, hospitalization, and prescribed drugs have also been offered. The annual premium has varied with the scope of services, ranging from about \$12 to \$72 per family in different regions and in different years. Free choice of doctor has been the rule. Professional and hospital bills have been paid from the pooled fund according to an approved fee schedule. Administration has been handled by a bonded trustee or a board of directors, made up of members, with a hired manager. Negotiations with physicians, dentists, druggists, and hospitals have usually been handled by FSA medical and technical personnel, and these officials ordinarily have given continual supervision over the routine business of the plan.

The prepayment plans grew rapidly, from the eight counties reporting in 1936 to the peak of 1,131 counties covered in 1942. While the vast majority of these plans were limited to a single county, there were a few multi-county units, so that this represented 1,062 different group plans. They had a combined membership of 116,631 families, or 615,985 persons in 42 states and Puerto Rico.<sup>4</sup>

During the war period and immediately after, the program declined. An important reason was the overall decline in the FSA case load. Beyond this, however, the proportion of eligible borrowers electing to join plans fell from 60 per cent in 1942 to 30 per cent in 1946. Factors contributing to this were the

growing shortage of rural physicians aggravated by the war, agricultural prosperity which gave to some farm families an unaccustomed sense of economic independence, rapid wartime turnover of FSA personnel, and the inherent weaknesses of voluntary enrollment. By June 30, 1946, the number of plans had declined to 635 in 951 counties in 37 states. The combined membership was 47,356 families, or 248,010 persons. A proportionately greater share of persons came to be protected for hospitalization, while a decreasing number were covered for physicians' care in the home or office.<sup>5</sup>

At this point, in August, 1946, Congress abolished the Farm Security Administration and set up in its place the Farmers Home Administration.<sup>6</sup> This brought about several changes. For example, FHA personnel lack authority to organize, conduct, or manage the group health plans. Although FHA still emphasizes the importance of using regular "farm and home" loans to pay membership premiums in any existing voluntary prepayment plan, it is obvious that survival of the original group health plans is seriously threatened by the curtailment of the actual organizational assistance hitherto rendered by the experienced FSA personnel.

Despite the decline in aggregate membership of the health plans during the war years, it may be noted that almost 1,000 rural counties—nearly one-third of those in the nation—still retain at least the skeletal structure of a voluntary prepayment medical care program.

The distribution of the FSA plans throughout the country and the type of service provided by each, as of June 30, 1946, is summarized in Table 1.

This is the situation confronting persons concerned about rural health today. The one most extensive rural medical care program—with widespread backing from farm groups—is seriously

TABLE 1

*Rural Prepayment Medical Care Plans of the Farm Security Administration,\* with Membership by Type of Service † — June 30, 1946*

State	Plans	Counties Covered	Number of Persons	Type of Service: Per cent of Families Served				
				Physicians	Surgical	Hospital	Drugs	Dental
United States ‡	635	951	248,010	59.7	58.2	73.4	17.7	23.7
Alabama	69	45	20,592	66.5	61.9	75.1	42.0	62.5
Arkansas	85	63	18,691	66.9	63.4	63.4	5.2	24.8
California	10	20	3,021	100.0	100.0	100.0	....	....
Delaware	1	3	135	....	....	100.0	....	....
Florida	2	4	236	100.0	70.4	70.4	....	....
Georgia	134	105	22,423	70.2	60.0	66.8	45.6	61.8
Idaho	5	5	1,198	100.0	100.0	100.0	....	15.5
Kansas	3	3	851	100.0	100.0	100.0	61.4	100.0
Kentucky	1	1	202	100.0	....	....	....	....
Louisiana	25	23	9,646	98.8	3.8	3.8	....	6.5
Maryland	1	1	102	100.0	....	....	100.0	....
Michigan	1	1	12	....	....	....	....	100.0
Minnesota	1	1	613	100.0	100.0	....	....	....
Mississippi	67	50	18,081	94.4	18.2	18.2	69.4	27.2
Missouri	2	2	229	100.0	100.0	28.3	28.3	28.3
Montana	4	22	8,068	100.0	83.3	35.1	....	....
Nebraska	6	7	978	100.0	91.1	100.0	67.2	55.2
New Hampshire	1	10	877	....	....	100.0	....	....
New Jersey	1	18	894	100.0	....	....	....	....
New Mexico	8	14	6,533	100.0	100.0	95.7	92.6	71.6
New York	8	10	1,617	75.7	84.1	100.0	....	....
North Carolina	17	99	41,323	52.2	77.2	84.8	....	0.04
Ohio	4	6	480	100.0	100.0	....	....	38.0
Oklahoma	17	61	25,461	22.6	20.4	100.0	3.2	11.5
Oregon	1	3	2,470	....	....	100.0	....	....
Pennsylvania	9	10	1,242	81.2	21.4	47.5	....	....
South Carolina	33	23	6,620	41.4	15.3	66.5	40.7	56.2
Tennessee	1	2	107	100.0	....	....	....	....
Texas	92	155	24,973	64.0	78.8	89.3	2.1	27.3
Utah	8	13	8,605	26.1	26.1	92.0	....	8.0
Vermont	1	14	110	100.0	....	....	....	....
Virginia	9	93	12,751	13.6	96.0	96.0	....	5.3
Washington	1	3	365	100.0	100.0	100.0	....	....
West Virginia	2	55	5,894	0.9	100.0	100.0	....	....
Wisconsin	1	2	1,061	100.0	100.0	....	....	....
Wyoming	3	3	1,023	100.0	100.0	100.0	54.2	54.2
Puerto Rico	1	1	525	100.0	100.0	100.0	100.0	....

\* Derived from unpublished tables compiled by the Health Services Section, Farmers Home Administration.

† In counties having two or more separate units offering different types of service the membership of the smaller unit or units has been deducted on the assumption that these families also hold membership in the larger unit.

‡ Including Puerto Rico.

in danger of disintegration unless new support is soon forthcoming. There would seem to be no more appropriate community agency to lend stability to this program than the local department of health. A number of practical reasons exist for health departments to rally to this opportunity. Before considering such reasons, however, it should be made clear that this would not be the first occasion for coöperation in this program between agricultural and public health agencies. Although the central task of building prepayment plans has been

directly assumed by Farm Security personnel, there have been a variety of activities in the sphere of preventive medicine and sanitation in which coöperation between FSA and public health personnel has for many years been successfully undertaken.

#### PUBLIC HEALTH COÖPERATION IN PREVENTIVE SERVICES

The basis for close working relationships between agricultural and public health agencies was laid early by the assignment of U. S. Public Health Serv-

ice personnel to the Department of Agriculture to assist in the development and operation of the program. Such assignments were both in the Washington office and in the field, and they included medical, dental, engineering, and statistical personnel. A number of administrative personnel, moreover, came from backgrounds in public health work. The Chief Medical Officer of the entire program has always been a commissioned officer of the Service, making periodic reports to the Surgeon General.

The Farm Security Administration was keenly aware of the importance of preventive services to complement its prepayment medical care plans. This was expressed by construction and educational programs in environmental sanitation, intensive planning in the agricultural and home aspects of nutrition, family education in personal hygiene, and encouragement in the utilization of health and welfare services of all local agencies.

Between 1937 and 1942, some 100,000 farm families in 1,023 counties of 45 states had been assisted in the physical improvement of their sanitation facilities. Over 92,000 sanitary privies were built, almost 50,000 family water supplies were protected, and more than 58,000 dwellings were screened. This was made possible by cash grants from the FSA, but all construction was in accordance with the standards of the state and local health departments involved.<sup>7</sup>

Except in Puerto Rico, where community water supply projects continued to be financed, grants for construction were discontinued after 1942. Efforts to improve farm sanitation, however, did not lapse. They took the form of cooperation with public health authorities in educating FSA borrower families about the importance of making improvements in their sanitary facilities largely through their own resources. Sometimes loans were made to help

finance the purchase of materials. In North Carolina, for example, there was a long series of meetings of FSA families with public health personnel devoted to instruction in farmstead sanitation requirements. Scores of local projects resulted from these educational efforts. In Nebraska, Kansas, Montana, Wyoming, and Colorado, sanitary engineers of the state public health agencies trained FSA personnel in the elements of farm sanitation, so that the information might be passed along to farm families. Similar activities in the states of the Pacific Northwest resulted in 121 major sanitary improvements on farmsteads in that area in 1946 alone.

A variety of projects were carried out to make available to FSA families the special preventive services offered by health departments. Such efforts were useful in complementing the treatment services available through the prepayment plans. In Louisiana, for example, FSA families in several parishes were given stool examinations to detect hookworm infestation, blood tests for syphilis, and immunizations against diphtheria. FSA personnel organized the presentation of specimens or attendance at clinics, and public health personnel rendered the technical service. In one county of Arkansas, the water supplies of FSA families buying their own farms were systematically tested. In another, a county public health nurse—together with a FSA Home Management Supervisor—visited all FSA families presenting troublesome health problems. In another county, arrangements were made for all expectant mothers in FSA families to attend a local prenatal clinic. In Clay County, Arkansas, 181 FSA farmhouses were sprayed with DDT by local public health workers and 1,150 typhoid immunizations were given in 1946. Immunization clinics were organized for children of FSA families in Nebraska. For years, public health nurses have addressed meetings of FSA



families in Michigan. Health educational literature, prepared with the assistance of public health workers, has been sent to FSA families in Arkansas, Nebraska, California, and Oregon. A four-parish program in health education was sponsored jointly in Louisiana in 1945 by the state departments of health and education and the FSA, using a full-time health educator. The FSA offices in Ohio, Washington, Colorado, Indiana, and other states have pioneered in the distribution of "guide books" containing information about all the health services available in the state.

Much of the coöperation has been through interchange of information between the field personnel working in the two programs. Public health officials in Nevada and Utah, for example, participated actively in training conferences for FSA county workers, thus equipping them to deal more effectively with health problems among the farm families they serve. In Mississippi, especially successful training courses were conducted by state public health personnel for FSA Home Management Supervisors in 1946, and for all FSA county workers in 1947. This instruction has equipped FSA workers better to deal with problems of maternal and infant care, nutrition, sanitation, infectious diseases, and other health matters which they meet in their daily contacts with farm families. Joint meetings of FSA and public health workers on many different subjects have been held in Minnesota, North Dakota, Ohio, Indiana, and other states.

In a few selected areas, where the Farm Security Administration sponsored and subsidized demonstration programs for improved rural medical care, relatively close and continuing relationship with public health authorities has been enjoyed. This was the case, for example, in Walton County, Georgia, where a grant-assisted prepayment plan for all interested farm families (not solely FSA borrowers) has been sponsored by the

Department of Agriculture during 1943-1946. The county health department here coöperated continually in the operation of this plan. A unique medical care program in Taos County, New Mexico, utilizing salaried personnel working in health centers, had the regular support of state and district public health groups in that state. Coöperation in the provision of nursing services to members of an FSA subsidized prepayment medical care program in Southeast Missouri was offered by the state public health authorities of that state. In 1947, a prepayment plan, with all services to be rendered through a community health center, was undertaken in Costilla County, Colorado. The Colorado State Department of Health is preparing to coöperate directly in this program. In this way preventive and curative medicine will be physically as well as functionally united.

Many further instances of coöperative working relationships between the Farm Security Administration and public health agencies could be cited. This should be sufficient, however, to indicate that, on a nation-wide basis, the area of coöperation involving preventive services has been broad. There has been a common gain from such mutual activity. The health department has advanced its regular work and the FSA medical care program has improved the preventive content of its services. Most important of all—farm families have been benefited.

#### CURRENT OPPORTUNITIES FOR EXTENDED COÖPERATION

Today, an even wider opportunity for coöperation is presented to public health agencies: an opportunity for participation in the medical care aspects of the program.\* As described above, the

\* Even in this sphere, coöperative activity would not be entirely new. In Natchitoches Parish, Louisiana, and in a few counties of Arkansas, the local health officer has acted as the trustee of the medical care prepayment fund itself.

recent legislative and administrative changes incident to the establishment of the Farmers Home Administration now necessitate curtailment of the activities of all the full-time agricultural supervisors and have resulted in drastic reductions in the health services staff.

It is important to remember, in this connection, that FHA loans to farm families can still be used for membership payments in existing prepaid medical plans. Thus, the financial aspects of the health groups do not change; it is the professional guidance and local leadership that have been lost. It is true, of course, that the outright grants formerly made to six or seven of the specially subsidized "experimental health programs" will no longer be available and that these particular projects must undergo financial as well as administrative readjustments. But the 635 "regular" health groups have operated solely on membership premiums and will continue to do so.

Technical help is badly needed if the plans are to maintain continuing relationships with the doctors and hospitals, to make periodic adjustments in the scope and cost of services, to help devise and revise fee schedules, to manage in the handling of funds to protect the interests of the professional groups and of the farm families, and to meet all the day-to-day problems that arise in a medical care plan. The local health officer is in position to offer considerable help in such matters.

As a matter of fact, this opportunity comes at a time when participation by health departments in programs of medical care is particularly opportune. Health departments everywhere are facing the task of gaining experience in this field.<sup>8</sup> The major medical care legislation before the 80th Congress, such as the National Health Act of 1947 introduced by Senators Taft, Smith, Ball, and Donnell, and the National Health

Insurance and Public Health Act of 1947, supported by the Administration, would place in existing health departments the major responsibility for administering large programs of medical care.\* It is increasingly recognized that public health agencies must gain "know how" in dealing with the basic problems of this field.

A more immediate consideration relates to the requirements of the current Hospital Survey and Construction program, already a responsibility of most state health agencies. It is generally recognized that hospital shortages are greatest in the most rural sections. Yet the present federal law requires the assurance that a hospital can be properly maintained, if it is to be entitled to grant funds.<sup>9</sup> The paradox is that rural communities in greatest need of hospitals are usually the least able to assure their financial maintenance. Even if this requirement were not in the law, the full utilization of newly constructed facilities would obviously be a concern of all local and state health personnel. The operation of a community prepayment plan would be perhaps the most practical approach to this problem of usage. In many rural counties where hospitals are needed desperately, prepayment plans under former FSA sponsorship have been operating for years. They can provide the basis for expansion into community-wide prepayment plans for hospitalization and possibly other health services. In many cases, this might well enable an otherwise ineligible community to qualify for needed hospital construction funds.

It will be claimed by some that far too many counties lack full-time health departments which might carry on this

---

\* In the former bill, assignment of responsibility to public health agencies is mandatory within two years of enactment. In the latter, such assignment of responsibility to health departments is not required but is indicated as preferable "in so far as feasible."

work. Actually, the great concentration of prepayment plans, as may be noted in Table 1, is in the states of the South, where full-time public health coverage is broadest. And it is in these states that the need for hospitals and for general medical care planning is undoubtedly greater than anywhere else.

What immediate steps might a health official take to meet this challenge? First, he might express an interest to the state or local supervisor of the Farmers Home Administration. FHA is dedicated to the principle of maximum utilization by its borrowers of the services of existing community agencies. A meeting might be called, assembling representatives of the doctors and the farmers who have coöperated in the program. The directors of the local hospitals used under the plan might be contacted. Perhaps there are problems in fee-payments, in the scope of services, or other matters that bear immediate discussion. Clerical assistance is often needed and the health department may be in a position to offer it. Possibly the public health nurses and sanitarians could stimulate enrollment of new members in the plans, as they visit farm families around the county. New contracts with participating professional groups or institutions may have to be drawn up, in which the health officer could offer technical assistance.

Some member of the health department might act as trustee of the group health fund handling fiscal matters. For this administrative service, cash payment of an amount equal to about 5 per cent of the fund may be offered. Public health personnel might play active roles on the advisory and executive boards of the health associations. Health educators could inform the general public about the operations and advantages of prepayment for medical care. Local health officers could arrange to receive regular statistical reports concerning the membership, services rendered, and

expenditures of the prepayment plans in their areas.

Even where an old FSA health plan has been allowed to lapse—because of the wartime factors mentioned earlier—initiative by the local health officer might serve to revitalize it. Competent technical guidance is frequently the difference between success and failure for these rural health groups. Health departments could stimulate the expansion of the small FSA plans into full-scale community programs encompassing all sections of the population.

There can be little doubt that responsibilities of public health agencies in the field of medical care are going to expand. Already a wide variety of medical care administrative functions have been assigned to health departments, in connection with hospital planning, welfare medical services, vocational rehabilitation, rural medical fellowships, cancer control, and other fields. Opportunities for gaining experience in the administration of health insurance plans as such, however, are not readily available. The FSA health program offers one such opportunity which has the advantage of having more than a decade of progress in back of it. This program has had the repeated endorsement of the American Medical Association and has received the active support of medical and other professional groups in nearly all the states.<sup>10</sup> Among farm people, it has won a place as a major effort to put medical services within the reach of low-income families.

Interested public health officials would find many farm groups deeply concerned with the development of more adequate rural health services. Support and assistance would be forthcoming from the large farmers' organizations that are fully aware of the rural medical care problems of the day. Support would likewise be forthcoming from the great network of county agents operating through the state agricultural extension

services and from personnel of other agricultural agencies. Many of these agencies would be greatly encouraged in their support of the rural prepayment plans by a demonstration of leadership from the health officer.

By taking the initiative to lend a helping hand in this rural health program, public health agencies can render rural people a tremendous service and, at the same time, become better prepared for the new tasks in medical care which lie ahead. Through such participation, the goal of a coördinated preventive and treatment service for all persons can be approached.

#### REFERENCES

1. Williams, R. C. Development of Medical Care Plans for Low-Income Farm Families. *A.J.P.H.*, 30:725-735 (July), 1940.
2. U. S. Senate. Sub-committee of the Committee on Education and Labor, 79th Congress, 2nd Session, Pursuant to S. Res. 74 (78th Congress) and S. Res. 62 (79th Congress). *The Experimental Health Program of Department of Agriculture, Washington*, 1946.
3. Mott, F. D., and Roemer, M. I. A Federal Program of Public Health and Medical Services for Migratory Farm Workers. *Pub. Health Rep.*, 60:229-249 (Mar. 2), 1945.
4. Farm Security Administration, *Health Services Program, October-December, 1942*, U. S. Department of Agriculture, Washington, Processed.
5. Farmers Home Administration, *Annual Report of Health Services Program*, U. S. Department of Agriculture, 1946, Washington, Processed.
6. Public Law 731, 79th Congress, Chapter 964—2nd Session, *The Farmers' Home Administration Act of 1946*.
7. Farm Security Administration, *Annual Report of the Administrator, 1942-1943*, U. S. Department of Agriculture, Washington.
8. Mountin, Joseph W. Participation by State and Local Health Departments in Current Medical Care Programs. *A.J.P.H.*, 36:1387-1393 (Dec.), 1946.
9. Public Law 725, 79th Congress, Chapter 958, 2nd Session, *Hospital Survey and Construction Act*, 1946.
10. Simons, A. M. Medical Service Plans of the Farm Security Administration (Report of the Bureau of Medical Economics of the American Medical Association). *J.A.M.A.*, 120:1315-1317 (Dec. 19), 1942.

# The Public Health Nurse's Contribution in the Annual Planning of a Public Health Program\*

MARION W. SHEAHAN, R.N., F.A.P.H.A.

*Director, Division of Public Health Nursing, New York State Department of Health, Albany, N. Y.*

AN annual plan for public health in a community is an administrative tool designed to assure essential service to meet the health needs of the agency's jurisdiction.

The processes used in formulating the plan could well be the administrator's methods of control of inter-agency and extra-agency relationships. It is his justification for a budget with which to employ personnel of specified number and qualifications with the equipment and facilities essential to their work. It outlines a series of related activities in the order of relative importance. It indicates broad methods of approach, to the whole, and for component parts. It determines the pace by limiting the time for accomplishment as far as practicable. It makes possible the discipline which accompanies a plan for co-ordination and a standard for evaluation through clearly stated purposes to which the agency is committed. It gives focus to interim planning for unit programs or projects which are points of attack in a complicated design. It makes possible the exercise of personal initiative and imagination in the discharge of assigned responsibility without danger

to the fixed purposes of the agency. It gives a concrete basis for the relationship between the representative of the agency and the client to be served.

Obviously such a plan is a dynamic tool for good direction. It must lead on to wider fields and better service while keeping within a realistic goal which is possible of attainment. A wise judgment in balancing such a program is based upon: (1) A knowledge of community needs and of scientific knowledge applicable to serve them. (2) The understanding of the skills and methods essential to an organized effort. (3) An appraisal of available experiences at each point in the organization or from without, if necessary, taking in the entire range from the top down the line to the consumer. (4) An appraisal of existing personnel and facilities to determine their adequacy to do the job proposed. It may be harsh to say that those who consider it wasteful of time to plan purposefully to secure specified results, have only to examine critically those multi-service health agencies which operate on the basis of each unit for itself.

Individuals who view serious planning for public health as a threat to their security might be interested to read Barbara Wootton's book *Freedom Under Planning*.<sup>1</sup> While her topic is the broad one of economic planning by government as an aid to cultural free-

---

\* Presented at a Joint Session of Public Health Veterinarians and the Health Officers, Public Health Nursing, and Public Health Education Sections of the American Public Health Association at the Seventy-fifth Annual Meeting in Atlantic City, N. J., October 6, 1947.

dom, the two conditions she outlines are pertinent to our field. She states the first condition as the obvious one that "Planning must know where to stop" and second, that "planners should show a nice discrimination in their methods."

It is probably true that efficient top officials like to manage, but the number who are deliberate autocrats is surely small compared to the number who appear autocratic through failure to recognize the importance of "nice discrimination in their methods."

The new approach to planning through offices of planning, which are being established in greater numbers in large public health agencies, is a recognition that planning is an agency-wide function and that methods are being defined to secure essential contributions from all groups. This may be the answer in our field to the question, "Who Is To Plan the Planners?" which is the title of the last chapter in Miss Wootton's book.

Probably the crux of this discussion is to consider the question, "how to secure the contribution of public health nurses and to utilize it to its fullest in program planning?"

#### CONTRIBUTION OF THE PUBLIC HEALTH NURSES

##### *Staff and Field Supervisors*

The public health nurse and her supervisor are in a position different from that of most other workers in the public health field. Clinicians, field engineers, and sanitary officers and the social worker, if employed in the health agency share with her in services at the periphery, but more than all others she is on the proverbial firing line where a plan meets its final test. She deals directly with doctors, patients, and their friends and families, with workers from allied agencies. Here enter the human elements of freedom of choice and the

fears which may run counter to a slide rule plan, if the attitudes of the people at the crossroads are not accurately gauged. Here the details, if poorly executed, may defeat the most idealistic purpose. Distance which separates this point from the center of planning increases the danger that acts of service, while good in themselves, will become unrelated to the broad purposes to be obtained. Often with the best of intention a good plan, *per se*, fails at the seat of execution. Here is a point where staff must be kept in tune with the agency through a certain understanding of its purposes. Given that understanding, here is a group whose contribution to planning will be to give: evidence of results obtained from services rendered; evidence of needs not expressed in vital statistics; adequacy in agency procedures; an estimate of the temper of the people at the crossroads; observations as to reasons for successes or failures.

#### DIRECTOR OF NURSING SERVICE

The director of the nursing service is the representative of the chief officer, and as such should be the intermediary between him and the staff. She is his aide in securing the contributions of the public health nurse at each point in the line of organization, and since everyone with responsibility is a planner of a sort in his or her own right, these contributions must go both up and down the line.

The methods she will use are many and are all needed in a constant and conscious effort to make the most of the processes of planning for the good of workers. These methods are not new:

1. Periodic conferences of the whole or, as indicated, of part of the staff with the director of nursing and on occasions with the chief officer and other directors.
2. Advisory committees within the agency and from without, when indicated.
3. Interviews for spot sampling of opinions or reactions.

4. A study of tabulations from records and reports to determine service rendered and results obtained.

5. Where a large area is encompassed mail communication to and from the central office to receive and present to the staff comments and problems for their consideration.

6. A meeting for acquaintance, no matter how brief, with all members of staff, if the chief officer visits a decentralized office.

In a large agency, much of the contributions of the staff of field nurses and supervisors must be summarized by the nursing director, for everyone cannot sit at a council table. The chief officer should assure himself that her advice to him and guidance for him of the nursing service are based upon democratic participation by the staff. Her individual judgment *alone* may become narrow and misleading in planning and prove a detriment rather than an asset.

The director of a nursing service should be expected to participate in planning councils in the central office through her grasp of organization for community health in general and her specialized knowledge of nursing in particular. She should be held responsible for authoritative advice on her specialty and for making wise judgments as to how it may be used to best advantage in any given plan. She should be able to estimate the adequacy of the nursing resources, within and without the department to get the job done. Preparation, numerical strength and

distribution should enter into her judgment. She later should be responsible for the details of a nursing program within a broad plan and for establishing nursing policy, procedure, interpretation, and stimulation and preparation of the staff who give the service to implement one part or another of the plan. Participation in the discussions whereby a broad plan is formulated is her indispensable preparation to carry her responsibility when the health officer gives the order. Her participation is the health officer's evidence to the nursing staff that they have representation and that he respects their specialty and receives their contributions. The knowledge, experience, and judgment he should expect from her, are indispensable to him since nursing is one of the specialized fields of which he has only general knowledge.

#### CONCLUSION

Provision for staff contributions to annual planning must obviously be part of agency procedure. An administration with the attitude which such provision implies will have gone far to accomplish that coveted *esprit de corps* from which springs sustained good service, the ultimate purpose for any overall plan.

#### REFERENCE

1. Wootton, Barbara. *Freedom Under Planning* University of North Carolina Press, 1945.



#### WEIGHING THE BABY

The statuettes made by John Rogers (1829-1904) were common features of the American home in the middle Nineteenth Century; and are now prized by the collectors of antiques.

The example reproduced above is in the office of the Visiting Nurse Association of York, Pa., and is reproduced by the courtesy of Miss Anna M. L. Haber.

It gives a vivid picture of one of our standard public health procedures; and illustrates the need of taking the human factor into account. The storekeeper is a bit puzzled by the extra load on the scales due to the intervention of a proud brother.



# American Journal of Public Health

## and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 37

December, 1947

Number 12

### Editorial Board

REGINALD M. ATWATER, M.D.  
*Chairman and Managing Editor*

LEONA BAUMGARTNER, M.D.  
MARTIN FROBISHER, JR., D.Sc.  
PROFESSOR JOHN M. HENDERSON

RALPH S. MUCKENFUSS, M.D.  
STUART MUDD, M.D.  
RAYMOND S. PATTERSON, Ph.D.

C.-E. A. WINSLOW, Dr.P.H.

C.-E. A. WINSLOW, Dr.P.H., *Editor*

AUGUSTA JAY, *Editorial Associate*

## THE ATLANTIC CITY MEETING

THE Seventy-fifth Annual Meeting of the American Public Health Association at Atlantic City, N. J., October 6-10, appears in retrospect as one of the notable gatherings in the history of our Association. The registration was not large (3,208); but this was to be expected in view of the fact that the expense of living at Atlantic City is high and that in such a resort there is no large reservoir of local physicians and nurses and medical students and other interested persons, such as is drawn upon in a large city. The leaders in public health were there, however, from every corner of the North American Continent; and we were honored by the presence of four of the outstanding officials in this field from the United Kingdom, of the Vice-Minister of Health of China, and of distinguished representatives from Brazil, Cuba, Denmark, and the Netherlands; with—for the first time—members of the staff of the World Health Organization. Particularly significant is the fact that thirty-one affiliated organizations held their meetings jointly or concomitantly with our own Association and its Sections.

There was some criticism of the fact that meetings of the Association and its Governing Council were scheduled for all five days; and it may be wiser in future to return to the plan in force in the past of leaving Monday of the week free for these affiliated groups.

All the twelve Sections of the Association held from one to four meetings by themselves (one for Maternal and Child Health, four for the Laboratory Section, two or three for each of the rest). Particularly notable were the Joint Sessions, which emphasized in wholesome fashion the cross-over of interests between different sections. Nine such joint sessions were held. One on Rheumatic Fever included Maternal and Child Health, Epidemiology, School Health, and Vital Statistics. One on Preparation in Health of School Personnel brought together School Health, Maternal and Child Health, Public Health Education, Public Health Nursing, and Food and Nutrition. One on Current Status of Immunization Procedures was sponsored by the Epidemiology, Health Officers, Laboratory, Maternal and Child Health, and School Health Sections.

All in all, 322 speakers participated in the discussions and 227 papers and reports were presented. Of the high quality of these communications, our readers may judge for themselves by approximately one-third of these papers—selected

for their general appeal to our membership—which will appear in this JOURNAL during the next six months. Many of the communications read at Atlantic City will be more usefully published in the professional journals representing their special technical fields.

It was generally agreed that the two special sessions devoted to the broad topic "The Heritage of the Past—The Seed of the Future" marked high points of the Atlantic City meetings. The addresses at these sessions were made by W. P. Shepard, H. R. Leavell, Homer Folks, Lowell J. Reed, Haven Emerson, Thomas Parran, C.-E. A. Winslow, and Raymond B. Fosdick. They will be published as promptly as possible in a special volume.

The illuminating Presidential Address of Harry S. Mustard, appears as the leading article in this issue of the JOURNAL.

The award of the Sedgwick Medal to Reginald M. Atwater for "distinguished service to public health," primarily through his leadership of our own Association, added a new name to an outstanding roll of honor. The Lasker Awards, for the second year, high-lighted "men and women in the field of medical research and public health administration whose efforts have contributed to, or will in time result in, the vastly improved health status of the peoples of the earth." Oswald T. Avery, Thomas Francis, Jr., and Homer Smith received awards for scientific research in their respective fields, Alice Hamilton and Thomas Parran for administrative achievement; and group awards were made to the British Ministries of Food and Health (Sir Wilson Jameson) and to the United States Committee on Joint Causes of Death (Lowell J. Reed).

The exhibit in the Convention Hall included 130 scientific and 127 commercial displays and was of unusually high quality and interest.

The new officers, whose names were announced at the Banquet included Martha M. Eliot as President, Charles F. Wilinsky as President-Elect, G. D. W. Cameron, J. T. Fontenelle, and Emilie O. Sargent as Vice-Presidents, and Louis I. Dublin as Treasurer. Dr. Eliot and Dr. Dublin are old friends in the higher councils of the Association. The choice of Dr. Wilinsky is a happy one. His leadership in hospital administration is in line with one of the most challenging problems which confront the health officer of the future; and he has been the animating force behind the admirable district health center program of the city of Boston. Our Vice-Presidents represent not only Canada and the United States but also Brazil; and, once again, a Vice-President of the Association has been chosen from beyond the boundaries of North America.

The most important action of the Association in the administrative field was an increase in dues for the various classes of membership; and the most significant resolution adopted was one calling for the removal of artificial legal restrictions on the sale of butter substitutes which is so essential to a sound national nutrition program.

Special mention should be made of the meetings of the three Standing Committees on Administrative Practice, on Professional Education, and on Research and Standards. These committees are the vital centers of the most productive services of the Association. All three of them held long and inspiring sessions at Atlantic City.

To the Editor, there were two more general aspects of the Seventy-fifth Annual Meeting which were of far-reaching significance.

The first of these was the unity of purpose and the sense of solidarity displayed by the Joint Sessions and throughout the formal discussions and the

social intercourse of these five days. The Association includes many special fields of interest—medicine, nursing, dentistry, laboratory service, engineering, nutrition, education, and the like. Each year there has developed a closer and more cordial integration of all these separate interests in a realization of the obligation of the public health profession as a whole for a common service to mankind.

The second outstanding significance of the Atlantic City meetings lay in a permeating sense of the new problems of the future in the field of public health. No one who heard the papers and panel discussions and the addresses at the Special Sessions, no one who felt the response of the audiences to the challenges presented, can doubt where the American Public Health Association stands. It is conscious of the heritage of the past. It recognizes its responsibility for the future.

### WHO IS UN-AMERICAN NOW?

ON July 2 last "The Subcommittee of the Committee on Expenditures in the Executive Departments Authorized to Investigate Publicity and Propaganda of Federal Officials in Formation and Operation of Health Workshops" made a report to the Committee of the Whole House.<sup>1</sup> This report has somewhat serious implications—although these implications may be somewhat different from those which the Subcommittee itself had in mind. The fact that the *Journal of the American Medical Association* has editorially summarized the report in question<sup>2</sup> warrants a study of its content.

There are essentially two sets of facts brought out in this report and used by its framers as the basis for an attack on:

1. The United States Public Health Service
2. The Children's Bureau
3. The Office of Education
4. The United States Employment Service
5. The Department of Agriculture
6. The Bureau of Research and Statistics of the Social Security Board

The first of these facts was that Surgeon General Parran on December 10, 1945, transmitted to all officers of the Public Health Service a copy of *House Document No. 380* which was President Truman's message to Congress on a National Health Program. He said in comment "Every officer of the Public Health Service will wish to familiarize himself with the President's message and will be guided by its provisions when making any public statement *likely to be interpreted as representing the official views of the Public Health Service.*" (italics ours.) Since June of that year (1945) all officers of the Service had been, by Executive Order 9575, covered into the armed forces with full military rights and obligations. Even under civilian conditions, however, such a warning as that issued in December, 1945, would have been entirely proper. The U. S. Public Health Service is a branch of the federal government, and it would be most unfortunate for any subordinate officer of that Service to "make statements likely to be interpreted as representing the official views of the Public Health Service" if those views were in opposition to those of the head of the government, whether acting as Commander-in-Chief of the Army or in his normal civil capacity.

The official views of the Service on any technical matter must be formulated by the Surgeon General himself. If his views differ from those of his official

political superiors, he can only resign. We infer from certain earlier writings of Dr. Parran that he did not feel the President's speech called for any such action. He might have taken much more vigorous steps. It would have been quite within his rights to point out that the need for some form of compulsory prepayment of medical costs is as important for the health of the American people as is the need for vaccination against smallpox. He did not follow any such course; he merely acted to protect the Service against the danger of possible criticism, by members of the federal family, of the policies advocated by the Chief of State.

The second mare's nest uncovered by the Subcommittee is the fact that between November, 1945, and November, 1946, a series of 26 "Workshops" were held in various parts of the country, under the auspices of the Service, for the discussion of problems relating to medical care. We deplore the word "Workshop"; but it has become a routine part of educational lingo. In any case, groups of citizens and experts in various areas of the field were convened and federal employees participated in the discussion of methods by which the important issues concerned could be brought before interested groups, so as to stimulate thought. The Subcommittee concludes that these discussions were planned "subtly to generate public sentiment in behalf of what certain witnesses and authors of propaganda refer to as socialized medicine." By the by, the Subcommittee is very fond of this phrase "what certain witnesses and authors of propaganda refer to as socialized medicine," repeating it half a dozen times. It puzzles us a bit. In the language of bodies like this Subcommittee, "propaganda" usually means the other fellow's argument; and no person well informed enough to discuss health insurance intelligently ever uses this phrase "socialized medicine" which has no intellectual content and is used only to stimulate the endocrines. There seems no valid reason why technical experts in the government service should not meet with groups of interested persons to discuss pressing public health problems. It is an important part of their duty to do so. No convincing evidence is adduced of the subtle generation of public sentiment; and whether we like the word or not, the "Workshop" is about as good a medium for democratic discussion as has yet been devised.

All this is pretty small potatoes for the activity of a group of representatives of the American people, convened in a Congress which faces the gravest world problems which have ever confronted the nation.

Even more serious, however, is the last paragraph of The Subcommittee report. "Suffice it at this time for your committee to report its firm conclusion, on the basic evidence at hand, that American Communism holds this program as a cardinal point in its objectives; and that, in some instances, known Communists and fellow-travellers within the federal agencies are at work diligently with federal funds in furtherance of the Moscow party line in this regard."

As to the Moscow party line, the members of The Subcommittee will perhaps be interested to learn that the U. S. A. and U. S. S. R. are the only two leading countries of the world which do not have some system of compulsory health insurance. They do not have it in the Soviet Union because they have a system of state medicine (which is radically different). For the United States to adopt such a plan would be to follow London, Paris, and the capitals of Holland and Sweden and Norway and Denmark—in direct opposition to Moscow.

As to the business of fellow travellers, the actual evidence which The Subcommittee has been able to collect is as follows. If it had any better evidence it would, no doubt have welcomed it. The facts submitted were as follows:

a. An obscure member of the staff of the Social Security Board "has been documented by the House Committee on Un-American Activities for almost uninterrupted association, since 1939, with various Communist and fellow-traveller organizations in the United States" according to The Subcommittee. How far such "documentation" may be justified we have no means of knowing. There is no evidence that he was ever condemned by any court; and it is easy to accuse.

b. It was once suggested in an office memorandum of the Security Board that this individual might be sent to New Zealand to study its health insurance program.

c. The Social Security Board "maintains close contact with movements for compulsory health insurance in other countries."

d. Another employee of the Social Security Board once assisted Senator Wagner in drawing up a health insurance bill.

e. Therefore, the Social Security Board is a Communist-front organization.

f. Much of the literature used in the "Workshops" was prepared by the Social Security Board. (This could scarcely help being the case since the studies made by this Board furnish the most authoritative statistical data we have, with respect to medical economics.) Unfortunately for the clarity of The Subcommittee's conclusions, neither the suspected Communist nor the head of Research and Statistics participated in the "Workshops."

But (g) since the "Workshops" used literature prepared by the Social Security Board (which had a humble employee accused of being a fellow-traveller) the U. S. Public Health Service which sponsors the Workshops must be tainted.

And finally, (h) since employees of the Children's Bureau, the Office of Education, the U. S. Employment Service, and the Department of Agriculture sent representatives to the "Workshops" they are probably "fellow-travellers" too.

On this House that Jack Built (or shall we say that Jerry built?) The Subcommittee bases its conclusion that "Known Communists and fellow-travellers with the federal agencies are at work diligently with federal funds in furtherance of the Moscow party line." Six bureaus of the federal government are pilloried because one employee of one of them has been charged with being a fellow-traveller, and the Attorney General has been officially asked to prosecute offending employees for taking part in "Workshops" mentioned. The true motivation of The Subcommittee is, probably, a quite different one. It appears to assume throughout that advocacy of health insurance is *ipso facto* an evidence of Communism. If this be the case, President Truman should be impeached for his message of 1945; and, since the 79th Congress did not condemn his address as emanating from Moscow, all its members must be considered as "fellow-travellers." Indeed, the 80th Congress might deserve the same designation, since its members sit in the same Chambers with many who supported the Wagner-Murray-Dingell Bill and who must be *ipso facto*, Communists.

The final paragraph of the report of the Subcommittee is the text for a shocking circular sent out to all physicians and dentists by the National Physicians Committee. It makes those who respect and love the medical profession somewhat heartsick to see the names of 13 physicians (most of them of outstanding position in the American Medical Association) at the head of this broadside.

We have no sympathy with Communism as a political movement. We believe that it is necessary to protect the United States against the influence of such citizens of our country as may hold secret allegiance to any foreign power. The *spirit* of Totalitarianism is, however, even more dangerous than its puny human

emissaries. If we adopt the methods of totalitarian ideology we are surrendering to the very worst element which is common to both Communism and Fascism. That is what is happening when we demand absolute conformity with the social program of one group which happens for the moment to be in power; stifle discussion, call everyone who differs a Communist and everyone who has ever been associated with any organization in which there was ever a Communist member, a fellow-traveller. Such an attitude abandons reason for ideology, and philosophy for perverted semantics. It overwhelms empirical evidence in a flood of catch-words. It enthrones emotion above reason, by discovering "Un-American art" and "Un-American Music" and "Un-American Science."

The writer of this editorial has behind him ten generations of New England stock. He learned that the American tradition meant freedom of thought and of speech (up to the limit of legally prosecutable action); that it meant open-mindedness and readiness to try experiments; that it meant initiative in the working out of the problems of society; that it meant experimentation and progress.

The other road—that of rigid conformity with the theory of a temporarily powerful group—of defining not only what a man must do but what he must think and feel—and with whom he may be acquainted—is the road to what is truly "Un-American." This was the technique of the Hitler regime in Germany and is the technique of the Communist leaders in Russia. Pray God, it may never become the prevailing mood of America.

#### REFERENCES

1. *House Report No. 786*. 80th Congress, First Session. July 2, 1947.
2. *J.A.M.A.* 134, 15:1240 (Aug. 9), 1947.

## ALCOHOLISM A PUBLIC HEALTH PROBLEM?

WE are glad to present in this issue of the JOURNAL two articles on the subject of alcoholism—or what Dr. Duryea describes as "Problem Drinking."

That this is in essence a major health problem, cannot be doubted. It has been estimated by E. R. Jellinek<sup>1</sup> that the number of chronic alcoholics in the United States is about 750,000 (slightly under 9 per 1,000 of the adult population), with a proportion of "inebriates" perhaps five times as great.

In the second place, it must be recognized that this is a medical problem—and not solely, or even primarily, a social or a moral problem. The chronic alcoholic is a sick person, whether his other accompanying physical and emotional disabilities are causes or results of alcohol addiction. Dr. Ray Lyman Wilbur is right in saying that "fundamentally, the chronic drinker is a problem for the doctor." The writer of this editorial can recall the refusal of one leading citizen, many years ago, to contribute to a certain outpatient service because its venereal disease clinic contravened the Scriptural injunction that "the wages of sin is death." We have outgrown that viewpoint in our social hygiene program. It still dominates our thinking about alcoholism; and this is the chief reason why the particular group of sick people under discussion is either wholly ignored or treated with stupidity and barbarity.

Third, this is a problem which we cannot dismiss as outside the range of human action because there is nothing that can be done about it. The success of "Alcoholics Anonymous," with its 35,000 members is proof to the contrary.<sup>2</sup> It is very probable that most of the readers of this editorial have members of that organization in their own circle of acquaintance. The Yale Plan Clinics at New Haven and Hartford have demonstrated the great value of a sound psychiatric approach in dealing with alcoholism.<sup>3</sup> The State of Connecticut has been so much impressed that in 1945 it established a special Board of Trustees of a State Fund for Inebriates.<sup>4</sup> Through the use of clinics and other facilities, it is "to provide diagnostic and treatment services for alcoholics, to study the problems of alcoholism and to disseminate information on this subject." The Board is supported by allocation of nine per cent of the fees received for permits by the Liquor Control Commission of the State.

Chronic alcoholism would thus seem to qualify as a public health problem on the ground of its social magnitude, its essentially medical nature and the fact that promising practical scientific methods of attack are now available.

The Health Officer cannot be expected to establish a new Bureau for the Control of Chronic Alcoholism. He cannot be expected to plan the exhaustive researches necessary before this problem can be wholly solved. But there are three things which he can do—and, we believe should do—in preparation for the day when the disease of alcoholism can be treated with the adequacy which it deserves:

1. He can ask his statistical service to collect such data as are available locally in regard to the local incidence of alcoholism and its relation to other characteristics of the population.

2. He can familiarize himself with existing facilities for diagnosis and treatment in this field and use his influence to secure the development of outpatient and inpatient services comparable to those now provided for most other diseases.

3. He can make every effort to influence the school system to replace outworn and tendentious propaganda by modern scientific knowledge in connection with this vital medical problem. The evidence presented in this issue by Mr. Hirsh is an urgent challenge to such a reform.

#### REFERENCES

1. Jellinek, E. M. Recent Trends in Alcoholism and in Alcohol Consumption. *Quart. J. Studies on Alcohol.* 8:1 (June), 1947. (Box 2162 Yale Station) New Haven, Conn.
2. Reynolds, R. Progress in the Treatment of Alcohol. *Connecticut State M. J.* 11:170, 1947.
3. McCarthy, R. A. A Public Clinic Approach to Certain Aspects of Alcoholism. *Quart. J. Studies on Alcohol.* 6:500, 1947. (See Ref. 1, above.)
4. Bacon, S. J. New Legislation for the Control of Alcoholism, the Connecticut Law of 1945. *Quart. J. Studies on Alcohol.* 6, 1945.

# Credit Lines

## "MODERN SEWAGE TREATMENT"

This is the title of an attractive brochure prepared by the General Electric Company. As with their film, "Clean Waters," an effort is made to present the subject in a manner that will appeal to the average citizen but at the same time be technically correct. It should serve a useful purpose for anyone trying to interest "town fathers" and civic leaders in the need for adequate sewage disposal. The booklet is looseleaf so that the few pages having specific commercial references can be removed easily if desired. Although not stated, copies probably can be obtained from the General Electric Company, Schenectady, N. Y.

## WHO BETTER DESERVES IT?

The American Medical Association has announced that on January 7, 1948, it will award the first annual Gold Medal for "a general practitioner who has rendered exceptional service to his community." The A.M.A. will receive nominations from state medical associations, chambers of commerce, woman's clubs, community councils, service clubs, etc. It asks that with each nomination be included the physician's name and address, his scholastic record, and a record of his service in the community.

Address the Section on General Practice of Medicine, A.M.A., 535 North Dearborn Street, Chicago 10.

## NEW PEDIATRIC JOURNAL

The American Academy of Pediatrics will publish a new monthly journal, *Pediatrics*, beginning in January, 1948, containing original articles on clinical pediatrics, nutrition, genetics, preventive medicine, psychology, nursing and medical sociology, education and social wel-

fare of children. A special section will be devoted to Latin American countries, where the academy has a program in operation. Abstracts of all original articles will be published in Spanish. Matters of interest in Congress, government departments and agencies in Washington will be reported. Communications of an editorial nature should be addressed to the editor in chief, Hugh McCulloch, M.D., 325 North Euclid Avenue, St. Louis 8. Advertising matter and subscriptions should be sent to Charles C. Thomas, publisher, 301-327 East Lawrence Avenue, Springfield, Ill.

## COMMUNICABLE DISEASE CENTER PROGRAMS

A copy of "Schedule of Field Training Programs, January 1-December 31, 1947" of the U. S. Public Health Service, Communicable Disease Center, Atlanta, Ga., and coöperative agencies, was received recently. Prepared by the Training Division of C.D.C., it describes briefly the 14 training schedules available. The foreword makes the general observation, "The Training Division is especially anxious to emphasize the practical field training nature of these programs. Field training experiences are designed to supplement academic instruction." The area of instruction covered goes from a program for senior laboratory staff members and directors to one on primary sanitation field training.

R. A. Vonderlehr, M.D., is Medical Director in Charge and E. S. Tisdale, is Chief, Training Division of C.D.C.

## HEALTH EDUCATION FOR RURAL TEACHERS

During the summer of 1947, a three



week health education course for rural teachers was given at the Pennsylvania State College with the coöperation of the Pennsylvania Department of Health and of Public Instruction. Attended by 68 rural school teachers from selected areas of Pennsylvania where follow-up supervision will be provided, it was designed to make clear the scientific bases for health and their practical application to rural schools. Scholarships were provided by various state and local voluntary health agencies, chiefly tuberculosis and health associations. The program should be helpful to those planning similar conferences in other rural areas.

#### SOME WISE WORDS ABOUT IN-SERVICE TRAINING

"Effective public health work calls for trained people," is the way George T. Palmer, Dr. P.H., introduces a very sensible and stimulating article on in-service training of health department employees. Originally presented before the Health Education Conference of the Western Branch, A.P.H.A., it is now available in the July 15 issue of *California's Health*. This is the semi-monthly organ of the California State Health Department where Dr. Palmer is Consultant in Public Health Administration.

#### LATIN AMERICAN INTEREST IN LOCAL HEALTH UNITS

Interest of Spanish speaking people in the concept of local district health units is evidenced in the June, 1947, *Boletín* (the Municipal Digest of the Americas) published in Havana. The lead article is a Spanish translation side by side with its English original, of selections from "Health Security Begins at the Local Level" published originally in a special public health number of *State Government* (February, 1946). This article discusses the need for modernizing local government in relation to local health services. Written by its

research assistant, Martha Luginbuhl, it is based upon *Local Health Units for the Nation*, the report of the A.P.H.A. Subcommittee on Local Health Units, prepared by its Chairman, Haven Emerson, M.D., and published by the Commonwealth Fund in 1945.

#### THE AMERICAN STATISTICIAN MAKES ITS BOW

With the August, 1947, issue (Vol. 1, No. 1), off the press in time for the 25th session of the International Statistical Institute meeting in Washington in September, the American Statistical Association started publication of a new bi-monthly journal, *The American Statistician*. Successor to the A.S.A. *Bulletin*, its avowed purpose is "to implement the growth of American statisticians . . . not a substitute for the Association's technical publications . . . but an adjunct to them, and an aid in professional development.

The first issue has a historical article on Lemuel Shattuck, founder of the American Statistical Association, and known to public health workers as the father, also, of official state boards of health following his plan for a Sanitary Survey of Massachusetts in 1850.

The author of the article, Walter F. Willcox, Professor Emeritus of Cornell University, reminds his readers that Shattuck and Ralph Waldo Emerson chose the older and shorter word, *statist* and eschewed the modern tongue-twisting *statistician*. Professor Willcox suggests that "lesser laborers in the same vineyard revive their practice."

#### SEX EDUCATION IN OREGON

"Sex Goes to School in Oregon" appears in the September *Better Homes and Gardens*, a monthly farm magazine published in Des Moines, Iowa. It tells just how the schools of Bend, a typical Oregon agricultural town of some 10,000 persons, are the laboratory in which the mandatory state-wide program of health

and physical education through the 12 grades will work.

Family life and sex education are taught along with the three R's and with no more fanfare. An important part of the article is the story of how the community was prepared for what might have seemed a radical departure. Oregon's state-wide education program is said to be the most extensive among the states.

#### ANNUAL REPORTS

Cook County's Department of Public Health annual report for 1946 is distinguished by its pictorial and graphic representation. There is a minimum of statistical data, none of it labored. Each page starts with a classic quotation ranging from Gladstone to the Proverbs. The back cover is a pyramid of healthful living which includes school health, improved housing, recreational facilities, and professional education, among others more generally recognized as health department functions. It is good to know that a health department recognizes its client as a total individual in this way. This report has much to suggest to those struggling to find new ways to tell old stories in annual reports. Edward A. Piszczek, M.D., is Cook County Health Commissioner.

"And This Is What We Did! . . . in 1946" is the title with which the 1946 annual report of the Columbia County (N. Y.) Health Department announces itself, and it proceeds to tell in simple readable language just what was done in the 14th year of this county's full-time health department. Sue Thompson Gould, M.D., was County Health Commissioner during the period of the report.

#### MICROFILM SERVICE OF ARMY MEDICAL LIBRARY

The feature exhibit of the 5th International Congress of Pediatrics held in New York City was a display of the

newest examples of microfilm duplication of the nation's greatest collection of medical literature sponsored by the Army Medical Library, Photo-duplication Division.

The Army Medical Library in Washington now has a collection of more than 1,000,000 volumes, some of the items going back to medieval times. These have been gathered and catalogued since 1836 when Surgeon General Joseph Lovell began the work during President Andrew Jackson's administration.

Through the microfilm service of the Army Medical Library, facsimile replicas of any of this material may be secured by physicians and libraries almost anywhere in the world. In 1946, 6,000,000 pages of medical literature were distributed on 551,102 feet of microfilm.

Articles in medical periodicals are duplicated for 50c each; books for 50c for each 50 pages or fraction thereof.

#### WORTH ACQUIRING

*These Services are Available to You* is a little pamphlet prepared by the Seattle City Health Department to tell citizens what services their health department can offer. A good medium both for getting the services used and for keeping public support. City Health Department, Seattle, Wash.

*The Story of Johnny and Mary*, subtitled "Better Food Makes for Better Living," is designed for the upper elementary grades. Recently published by the University of Florida. Sloan Project in Applied Economics (Gainesville, Fla.), it is good material for teaching proper nutrition and its significance for health to school children. At about the same time, the Florida Health Department issued its Nutrition Survey number, July, 1947, which makes a good companion piece to *The Story of Johnny and Mary*.

*Modern Food Magic*, published by the Hartford Nutrition Committee, tells in simple words how to perform miracles

in your kitchen—stretch the dollar and still keep the family well fed, happy, and healthy. One whole page tells how to “cheat the garbage can.” Available from the Greater Hartford Community Council, 17 Lewis Street, Hartford, Conn. at 8c each or 7c each in lots of 1,000 or more.

“Slidefilms and Motion Pictures—To Help Instructors” is the title of a new catalog of selected visual teaching aids produced and distributed by the School Service Department of the Jam Handy Organization. This booklet lists discussion slidefilm kits, sound slidefilms, and educational sound motion pictures for vocational training and classroom use. Subjects have been selected for timeliness and adaptability to current

teaching trends and instructors’ needs. Copies of this catalog may be obtained from the Jam Handy Organization, 2821 East Grand Boulevard, Detroit 11, Mich.

*Make Your Town Safe!*—This most recent of the Public Affairs Pamphlets, by Herbert Yahraes, is a valuable summary of accident figures, how they can be reduced, and the organization of a community accident prevention program. Its illustrations, though dealing with gruesome matters, are on the light side and very effective.

Available from the Public Affairs Committee, Inc., 22 East 38th Street, New York 16, at 20 cents per copy. Quantity rates are available on application.

## BOOKS AND REPORTS

*All reviews are prepared on invitation. Unsolicited reviews cannot be accepted. All books reviewed in these columns may be purchased through the Book Service.*

*The Years After 50—By Wingate M. Johnson, M.D. Foreword by Morris Fishbein, M.D. New York: McGraw-Hill, 1947. 153 pp. Price \$2.00.*

Dr. Morris Fishbein, who is editor of the Whittlesey House Health series of which this is one, could hardly have found a better author for this volume than Dr. Wingate Johnson. He is a distinguished physician, Professor of Clinical Medicine at the Bowman Gray School of Medicine, and recently designated a trustee of the American Medical Association, but, more important still, the volume reveals such wisdom and philosophic understanding of human beings as is given to not many men. Added to this, it is a rare treat to come across a literary style that is as delightful as this. Dr. Johnson has proved that sometimes a busy physician can beat the professional writers at their own game, and what's more he has achieved the happy combination of good writing and strict scientific accuracy.

The purpose of the book is to help the intelligent man and woman prepare for the latter half of life. It will also prove helpful for those laymen and physicians who have the responsibility of caring for the aged, whether it be a dependent on the one hand, or a medical practice on the other.

On only one minor point does the reviewer fail to go along with the author. Dr. Johnson stresses the importance of mental exercise to keep this faculty keen, but he reveals perhaps his own predilection, and age (plus 60), in minimizing the importance of keeping the physical faculties in trim. The reviewer likewise may be disclosing his

inclination and age (minus 45) in believing that moderate and regular exercise is equally desirable to preserve muscular and vasomotor tone from atrophy. It seems to the reviewer that those whose muscles and cardiovascular responses are flabby through lack of use are not in good fettle to respond to the stress of emergencies and severe illness, and they are the ones that often slowly fade out for no good organic reason under such conditions.

THEODORE G. KLUMPP

*The Acute Infectious Fevers: An Introduction for Students and Practitioners—By Alexander Joe, M.D. Philadelphia: Blakiston, 1947. 276 pp. Price, \$4.50.*

This small volume, as the subtitle implies, is intended primarily for medical students, and as such does a fine job of summarizing current British medical practice with respect to a dozen of the more common communicable diseases. There are few aspects of these diseases with which the author has not had a good deal of personal experience, and, as stated in the preface, he has firmly resisted the temptation to write on subjects not covered by this experience. Thus, for example, poliomyelitis, the dysenteries, the encephalitides, the Rickettsial infections, infectious hepatitis, influenza, and many other equally important communicable diseases are not even mentioned.

However, despite the lack of broad coverage in subject matter, the detailed discussion of each disease considered (streptococcal infection, diphtheria, pertussis, meningococcal meningitis, ty-

phoid, measles, chickenpox, smallpox, mumps, and rubella) is for the most part excellent. It is a pleasure, indeed, to find a medical textbook which occasionally cites references to articles published within a year of the appearance of the text itself. Thus, brief mention is made to most of the important recent contributions to our knowledge of these diseases.

Particular attention has been devoted to a description of the clinical course, to diagnosis and treatment; however, the epidemiology and prevention are given careful and concise consideration. In general the author's opinions in these matters conform closely with those held by workers in the United States. One is impressed again by the extent to which we in this country are indebted to the British for a large share of our knowledge of these diseases. Nevertheless, most of us on this side of the Atlantic would quarrel with Dr. Joe's recommendation concerning the best time for primary active immunization against diphtheria—that it "should be carried out as early as possible after the first birthday"—and would hardly agree to his statement reflecting current British opinion that, "It would be wise to regard specific prophylaxis in whooping cough as still in the experimental stage." Despite such points of disagreement and certain omissions, this text can be highly recommended. ROBERT F. KORN

**Studies of Typhus Fever**—*National Institute of Health Bulletin. No. 183, U. S. Public Health Service, 1945. 110 pp.*

This pamphlet consists of 9 papers representing the work of the Rickettsia Unit, Division of Infectious Diseases of the National Institute of Health, made between 1941 and 1944, much of the information being withheld from publication owing to the confidential nature of the researches. All the papers detail the various methods and results in the

preparation of epidemic typhus vaccine by the egg yolk culture method which will be invaluable to those laboratory workers concerned in this and related problems. A comparison of the vaccine prepared according to the original Cox's method and those with ether extraction was first made with the complement-fixation method, and later confirmed by the neutralization test for the lethal substance also obtained by the yolk sac culture. Both demonstrated quite clearly the superiority of the latter methods. It is therefore of special interest that by means of these newer methods for the testing of antigenicity, the value of vaccines prepared by different methods hitherto recommended by various workers against epidemic typhus fever may be systematically examined.

SAMUEL H. ZIA

**The Municipal Year Book, 1947**—*Edited by Clarence E. Ridley and Orin F. Nolting. Chicago: The International City Managers' Association, 1947. 550 pp. Price, \$8.50 if remittance accompanies order; otherwise \$9.00.*

This annual volume continues to be an indispensable encyclopedia of municipal activities. The current national interest in hospitals, inspired by the Federal Hospital Construction Act, is reflected in a table giving data about 266 municipal hospitals in nearly as many cities. No figures on municipal health departments such as were reported in earlier volumes are given in the current volume.

The short chapter on public health developments in 1946 by Ira V. Hiscock, Sc.D., ranges over the country and picks out many significant items that a variety of readers will want to pursue further.

The volume contains a graph showing trends of median salaries of patrolmen from 1943 to 1947. This could well be repeated in other years for other groups of municipal employees, particularly public health workers and teachers. The

chart showing indexes of cost of living and municipal salaries is also worth repeating in more detailed form.

REGINALD M. ATWATER

**The Administrative Internship in the Hospital**—By *Paul B. Gillen and Charles E. Prall*. Published by the *Joint Commission on Education, Chicago* (22 East Division Street), 1947.

The Joint Commission on Education is a temporary body representing the American Hospital Association and the American College of Hospital Administrators, and sponsored by the W. K. Kellogg Foundation which has also made grants to several of the university courses in hospital administration. As one of its missions, the Joint Commission has undertaken to supply curricular assistance to the authorities of the universities where graduate training in hospital administration is offered. An administrative internship of at least twelve months is required in connection with each of the existing university courses in hospital administration, and the Commission has given assistance in the planning of such internships. The manual is an important contribution to this program.

This helpful manual will be of primary interest to the faculty and students in the hospital administration courses and to the hospital administrators who are now preceptors for administrative interns or who may expect to serve in that capacity. It describes the advantages of the internship from the standpoint of the hospital and from that of the student. The educational plan for the administrative internship is presented in detail according to the student's levels of growth and development. It emphasizes the importance of a close relationship between the preceptor and the intern. The scope of the work in each department is outlined. Topics for responsible assignments are suggested.

CLEMENT C. CLAY

**Blue Print for a Healthy Community**—The Chicago-Cook County Health Survey. *Chicago: The Advisory Committee* (54 W. Hubbard Street). 100 pp. Price, \$.35.

This summary of a huge survey by the U. S. Public Health Service is an "audit of all health facilities in the great metropolitan area of Chicago . . . in which live 4,500,000 people."

The breadth of a modern public health program is impressive. Only ragweed control appears to have been omitted. Great and complex problems were met, as well as ones we all know—even to open privies.

The studies of dental health and medical-social work present significant advances in evaluation. The school health section makes one again acutely aware of the lack of genuinely useful indices of accomplishment in this field.

ROSCOE P. KANDLE

**Anatomy and Physiology for Students of Physiotherapy**—By *C. S. V. Smouts, M.D., M.R.C.S., L.R.C.P., and R. J. S. McDowall, M.D., D.Sc.* (2nd ed.) *Baltimore: Williams & Wilkins*. 470 pp. Price, \$8.00.

This textbook is a revision of one published in 1944 and is planned in accordance with the *Syllabus of the Chartered Society of Physiotherapy* in England. The older terminology is used, which might be somewhat confusing to beginning students in this country. The authors do not expect this book to replace larger texts in anatomy and physiology.

Perhaps the four most valuable chapters for reference purposes in the section on anatomy are: "Anatomical Regions"; "Living Anatomy," which has been enlarged; "Levers and Leverage," which is new; and "Muscles in Action," which defines the physical properties of muscle and types of muscular work performed. An attempt has been made to simplify anatomy, which is a difficult

thing to do, especially in describing muscle action. The result is that, unless the student already knows the various actions of a muscle, he would be at a loss.

The section on physiology was written for students who may not have had either chemistry or physics and is interesting and informative. The application of physiology in the use of physical therapy modalities is stressed.

The illustrations are excellent and generously supplied throughout. While it may not be desirable as a text, this work does contain valuable material as a reference book for physical and occupational therapists.

CLARA M. ARRINGTON

**Genetics, Medicine, and Man—**  
*By J. H. Muller, C. C. Little, and Lawrence H. Snyder. Ithaca, N. Y.: Cornell University Press, 1947. 158 pp. Price, \$2.25.*

For most public health workers genetics is one of the little known, minor biological sciences. Until very recently medical and public health curricula were satisfied with brief mention of hemophilia, common in European royal families, and albinism. Most reported hereditary conditions were too rare to justify more than passing reference. Discovery of the Rh factor and its far-reaching importance in maternal and infant health, has re-awakened public health interest in the subject of heredity.

*Genetics, Medicine, and Man* provides a stimulating review by three eminent specialists. Originally presented as the Cornell Messenger lectures, the informal lecture style adds to the readability of the material.

Dr. Muller summarizes the fundamentals in non-technical language. Equally important for the general reader, he describes the work of the genes in differentiation. Those of us who recall classroom description of mitosis and meiosis in purely mechanical

terms will particularly enjoy Dr. Muller's enlightenment on the dynamics of these processes.

Readers will find Dr. Little's chapters provocative in a different way. His chapters on Parental Influence and on Growth and Individuality highlight a dozen fields in which active research is under way.

Dr. Snyder presents a dependable yet brief summary of human heredity. Specific information on a variety of conditions is included.

MORTON D. SCHWEITZER

**State Central Case Record Systems and Local Case Registers for Tuberculosis—**  
*By U. S. Public Health Service, Washington, D. C.: Federal Security Agency, 1947. 88 pp.*

This manual describes clearly, simply, and completely how tuberculosis case registers should be planned, installed, and maintained technically. Eight of the ten chapters are devoted to description and discussion of central state tuberculosis case registers (termed "State Central Record Systems"). The other two chapters deal with local case registers.

The manual contains a tentative recommendation that the installation of state case registers be considered in states with populations under four million. Such state registers would contain a summary of current important information for every known case or suspect in the state who is under medical supervision or in need of it. The information would be obtained from various types of reports routed to the central state health agency, including case reports, clinic examination reports, hospital admission, and discharge reports, public health nursing reports, reports from private physicians, laboratory reports, and others.

Such current case summaries would provide sources of knowledge about tuberculosis in the state which would

obviously be of immense value in evaluating, planning, and administering the state tuberculosis control program. However, whether or not a state record system of the *detailed* type recommended would be practicable in so many states is a question which can be settled only after longer experience with it in more states.

The manual emphasizes that the installation of a state record system is a desirable prerequisite to the establishment of local registers in most states. But it recognizes that "the development of a State Central Record System before the existence of local registers leads to many difficulties, the foremost of which is that, in the beginning, the state system must contain more elaborate information than would be necessary if local registers were in operation. Once local registers are developed, the state can make the transition from complexity to simplicity with little effort."

The purposes and methods of use of a state record system are discussed fully. But insufficient attention is given to the methods of using a local case register for its primary purpose of assisting the local health department in the public health supervision and management of individual cases. There is a lack of sufficient emphasis on the fundamental point that the routine clerical maintenance of a register must be supplemented by active professional interest, interpretation, and use by the health officer, the tuberculosis administrator, and the public health nurse.

The clerical procedures recommended are admirably presented in orderly detail. The format is excellent and unique. The inclusion of specimen report forms and statistical tabulation forms adds greatly to the technical value and usefulness of the manual.

EDWARD X. MIKOL

**The Ranks of Death: A Medical History of the Conquest of America**

—By Colonel P. M. Ashburn. New York: Coward-McCann, 1947. 298 pp. Price, \$5.00.

The late Colonel P. M. Ashburn, at one time librarian of the Surgeon General's Library, has here described and interpreted the medical history of early American settlement. His son, Frank D. Ashburn, has added introductory observations. The book does not provide a historical narrative of the usual sort, since it is arranged primarily in terms of diseases rather than in time sequence. This makes it seem disjointed to the historian, but will appeal to medical men interested in the historic role of particular forms of illness. Spanish-American and English sources are carefully assembled and analyzed.

The following conclusions are presented: (1) that the Indians suffered most from the exchange of European, African, and American diseases; (2) that resulting Indian mortality greatly facilitated the conquest; but that (3) whites and Negroes later suffered much from infections they themselves had introduced. These theses are not novel, but are presented in a convincing manner. The author also discusses disease origins, and adds the sound observation that much illness subsequently ascribed to infections was really starvation or scurvy.

One may question conclusions at a few points; e.g., that it was primarily Negroes who conveyed malaria—which hardly accounts for its wide distribution in colonial New England. The reviewer agrees with the author that historians have usually overlooked the great significance of the disease factor in the conquest. Since Colonel Jones wrote a decade ago, however, a number of careful studies have appeared, such as those of Childs and Ackerknecht on malaria. The bibliography appended is helpful, but does not seem to come down beyond about 1936.

RICHARD HARRISON SHRYOCK



**Insect Pests**—By William Clunie Harvey and Harry Hill. (2nd ed.) London: H. K. Lewis & Co., Ltd., 1947. Price, 14s net.

The second edition of this English text on insect control has been enlarged by the addition of two new chapters, No. V on "Mosquitoes and Moths," and No. X on "DDT."

The first six chapters on the characteristics and habits of the more important insect pests are generally well written. An occasional confusion in species identification may be noticed, for example, on page 79, where the obsolete term *Stegomyia calopus* is used as if it were a different species from *Aedes aegypti*.

The new chapter on mosquitoes and moths suffers from an apparent lack of acquaintance with newer methods of control, particularly naturalistic methods of value in the control of disease vectors in tropical areas.

Chapter VII on Building Construction and Infestation is particularly well done in concise form. In other chapters too much detail is presented regarding control methods now rendered practically obsolete by newer insecticides and techniques.

The general presentation of DDT in Chapter X is good, but apparently much recent American military and civilian experiment and experience was not available to the authors.

Much of the arrangement of the material is excellent, particularly the presentation of advantages and disadvantages of various materials and methods. The illustrations, however, are frequently disappointing.

The book is apparently written for conditions in the British Isles, and will be of only limited value in American and tropical areas. HAROLD F. GRAY

**A Symposium on the Effects of Soil Elements on Food**—By T. J. Brooks. Tallahassee, Fla.: State De-

partment of Agriculture, 1947, 175 pp.

The "Symposium" is a motley collection of popular articles and scientific papers on various phases of the "Effects of Soil Elements on Foods" reprinted from publications as diverse as the *Saturday Evening Post*, the *Florida Times Union*, *Miscellaneous Publication No. 536* of the U. S. Department of Agriculture, *Archives of Biochemistry*, and *Southern Medicine and Surgery*, prefaced by four very short chapters by the "author," T. J. Brooks, Assistant Commissioner of Agriculture of the State of Florida. Approximately one-fourth of the reprinted articles are concerned primarily with deficiencies in the soils of Florida; the remainder are chiefly reviews of our present knowledge of the role of minor elements in plant and animal nutrition and the relationship between soil composition and the health of the plants and animals grown on it. This collection of reprinted articles will be of considerable interest to many public health workers who desire to broaden their knowledge of the importance of the minor elements in plant and animal nutrition and the role of soil composition in the production of crops and animals.

DONALD K. TRESSLER

**Text Book of Microbiology**—By Kenneth L. Burdon, Ph.D. (3rd ed.) New York: Macmillan, 1947, 728 pp. Price \$3.50.

The 3rd edition of this book has been thoroughly revised, and presents a good general survey of the field of bacteriology intended for beginning students.

The book is divided into four parts: Part One, Elements of Microbiology; Part Two, Methods of Destroying Microorganisms and of Controlling the Spread of Communicable Disease—Sources and Modes of Infection; Part Three, Infection and Resistance; and Part Four, Microbiology of Important Infectious Diseases.

The author states: "The purpose has been, as before, to write a clear, balanced account, which is comprehensive and scientifically sound, yet easily understandable, and of real usefulness to student nurses and others interested in the medical and public health aspects of microbiology." As a whole this has been accomplished and it can be recommended to those interested in the general survey of bacteriology.

CHARLES A. HUNTER

**Medical Addenda: Related Essays on Medicine and the Changing Order—***New York: The Commonwealth Fund, 1947. 156 pp. Price, \$1.75.*

Those who are familiar with the studies of the New York Academy of Medicine, Committee on Medicine and the Changing Order will find in these five essays a maturation of this committee's broad and timely objectives.

The theme of the first essay by Dr. James Alexander Miller is well epitomized in its final sentence, "In any program for the improvement of medical care the master key to the situation is in the hands of the doctor himself." This and the second essay on Psychosomatic Medicine by Dr. Louis Hamman should be required reading for those who guide the educational destiny of young physicians.

The strong and growing collaboration between medicine and social work is clearly presented in the next two essays, for the medical social worker by Mary Antoinette Cannon and Harriett M. Bartlett, and for the psychiatric social worker by Winifred W. Arrington.

Three phases of medical practice too long neglected and recently emerging into our consciousness are discussed in the final two essays. Dr. Howard Rusk describes the subjects of rehabilitation and convalescence from his intimate wartime and subsequent post-war experience in physical medicine. Dr. Ernst Boas presents an authoritative and well

documented discussion of medical and social problems peculiar to chronic disease. Medically, he stresses the importance of prevention and the need for expansion of present facilities for chronic disease treatment. He believes that the social and economic problems in this field must be attacked by some form of disability insurance and by community planning for more than custodial care and for rehabilitation.

CHARLES E. SHEPARD

**Statistical Analysis in Biology—***By K. Mather. (2nd ed.) New York: Interscience, 1947. 267 pp. Price, \$5.00.*

Dr. Mather, as a biologist and non-mathematician, appreciated "the necessity for a better understanding of the potentialities of statistics amongst experimentalists" and has discussed and utilized various methods with sample analyses from the field of genetics. The text includes tests of significance, degrees of freedom and the analysis of variance with the principles of partition, linear, polynomial and multiple regression, inter-class, partial and intra-class correlation, the analysis of frequency data including partitioning chi square, estimation and angular and probit transformations. The steps in the analyses are carefully explained and the examples are clear. Although the public health statistician only rarely uses these methods, he should be cognizant of the advancement of such statistical methods and the practical uses in specialized fields.

RUTH R. PUFFER

**The Sanitary Inspector's Handbook —***By Henry H. Clay, F.R., San.I., F.I.S.E.; Major, R.A.M.C.; with an introduction by Sir Wilson Jameson, M.A., M.D., F.R.C.P., D.P.H. (6th ed.) London: H. K. Lewis & Co., Ltd., 1947. 545 pp. Price, 22s.*

This is the sixth and revised edition of a book originally published in 1933.

It is designed to assist sanitary inspectors of England, Scotland and Wales in solving their technical and legal problems, and to serve as a text for candidates for certification as "sanitary inspectors" by the Royal Sanitary Institute and Sanitary Inspectors Examination Joint Board.

The author considers only British laws, regulations and practices. For that reason, American readers will find much of the book not applicable to this continent. No doubt many American

public health officials will regret that there is not available a similar text for their particular health jurisdictions. Major Clay's book should be of great value to any American reader who might contemplate the preparation of a compilation of sanitation laws, regulations and methods for a specific health jurisdiction. It should also be of interest to anyone who wishes to compare British and American public health administration and practice.

HERBERT M. BOSCH

## BOOKS RECEIVED

- ADVANCES IN INTERNAL MEDICINE, VOL. II. Edited by William Dock, M.D., and I. Snapper, M.D. New York: Interscience, 1947. 642 pp. Price, \$9.50.
- ARTIFICIAL PNEUMOTHORAX IN PULMONARY TUBERCULOSIS. By T. G. Heaton, M.B. (2nd ed.). New York: Macmillan, 1947. 292 pp. Price, \$4.50.
- CHILD CARE AND TRAINING. By Marion L. Faegre and John E. Anderson. (7th ed.). Minneapolis: University of Minnesota Press, 1947. 310 pp. Price, \$3.25.
- CORNELL CONFERENCES ON THERAPY, VOL. II. Edited by Harry Gold, M.D. New York: Macmillan, 1947. 354 pp. Price, \$3.75.
- DIABETES AND THE DIABETIC IN THE COMMUNITY. By Mary E. Tangney, R.N. Philadelphia: Saunders, 1947. 259 pp. Price, \$2.75.
- DIAGNOSTIC BACTERIOLOGY. By Isabelle Gilbert Schaub, A.B., and M. Kathleen Foley, A.B. St. Louis: Mosby, 1947. 532 pp. Price, \$4.50.
- THE EXPERIMENTAL HEALTH PROGRAM OF THE UNITED STATES DEPARTMENT OF AGRICULTURE. A Study Made for the Subcommittee on Wartime Health and Education of the Committee on Education and Labor, U. S. Senate. Washington: U. S. Government Printing Office, 1946. 166 pp.
- ENDOGENEOUS ENDOCRINOTHERAPY INCLUDING THE CAUSAL CURE OF CANCER. By Jules Samuels, M.D. Amsterdam, Netherlands: Holdert & Co., Ltd., 1947. 539 pp. Price, \$8.75.
- FOUNDATION FOR AMERICAN EDUCATION. By Harold Rugg. New York: World Book Company, 1947. 826 pp. Price, \$5.00.
- FUNDAMENTALS OF IMMUNOLOGY. By William C. Boyd, Ph.D. (2nd ed.). New York: Interscience, 1947. 503 pp. Price, \$6.00.
- HANDBOOK OF COMMUNICABLE DISEASES. By Franklin H. Top, A.B., M.D. (2nd ed.). St. Louis: Mosby, 1947. 992 pp. 95 ill. Price, \$8.50.
- HISTORY OF MEDICINE. By Cecil A. Mettler, A.B., Ed.B., A.M., Ph.D. Philadelphia: Blakiston, 1947. 1215 pp. 16 ill. Price, \$8.50.
- HOW LIFE IS HANDED ON. By Cyril Bibby. New York: Emerson, 1947. 153 pp. Price, \$2.00.
- HOW TO INTERPRET SOCIAL WELFARE. By Helen Cody Baker and Mary Swain Routzahn. New York: Russell Sage, 1947. 135 pp. Price, \$2.50.
- LABORATORY MANUAL OF MICROBIOLOGY FOR NURSES. By Elizabeth S. Gill, B.S., R.N., and James T. Culbertson, Ph.D. New York: Putnam, 1947. 116 pp. Price, \$1.50.
- LEADERSHIP IN WAR AND PEACE. By Sanford Winston. Raleigh, N. C.: N. C. State College of Agriculture and Engineering, 1946. 139 pp.
- LETS TALK ABOUT YOUR BABY. By H. Kent Tenny, Jr., M.D. (3rd ed.). Minneapolis: University of Minnesota Press, 1947. 115 pp. Price, \$1.50.
- THE LOUSE. By Patrick A. Buxton, C.M.G., F.R.S. (2nd ed.). Baltimore: Williams & Wilkins, 1946. 164 pp. Price, \$3.25.
- MARRIAGES ARE NOT MADE IN HEAVEN. By Janet Fowler Nelson, Ph.D. New York: The Woman's Press, 1947. 158 pp. Price, \$1.75.
- THE NATIONAL FOUNDATION FOR INFANTILE PARALYSIS. Annual Report for 1947. New York: National Foundation for Infantile Paralysis, Inc. 86 pp.

- NUTRITION AND THE PUBLIC HEALTH. A Study Guide.** By Adelia M. Beeuwkes, and John J. Hanlon, M.D., M.P.H. Ann Arbor, Mich.: Overbeck, 1947. 120 pp. Price, \$2.50.
- OLD PEOPLE.** Report of a Survey Committee on the Problems of Ageing and the Care of Old People. B. Seebom Rowntree, C.H., LL.D., Chairman. London, Eng.: Oxford University Press, 1947. 202 pp. Price, 3s. 6d. net.
- THE POLITICAL PROBLEM OF INDUSTRIAL CIVILIZATION.** By Elton Mayo, Cambridge, Mass.: Harvard University Press, 1947. 26 pp. Price, \$.50.
- PRACTICAL CLINICAL PSYCHIATRY.** By Edward A. Strecker, A.B., A.M., Sc.D., Litt.D., LL.D., M.D., Franklin G. Ebaugh, A.B., M.D., and Jack R. Ewalt, M.D., (6th ed.). Philadelphia: Blakiston, 1947. 476 pp. Price, \$5.00.
- PRACTICAL PSYCHIATRY AND MENTAL HYGIENE.** By Samuel W. Hartwell, M.D. New York: McGraw Hill, 1947. 439 pp. Price, \$3.75.
- PROVINCE OF MANITOBA—DEPARTMENT OF HEALTH AND PUBLIC WELFARE.** Annual Report for 1946. Winnipeg, Manitoba, Canada: King's Printer, 1947. 252 pp.
- RECENT ADVANCES IN PUBLIC HEALTH.** By J. L. Burn, M.D., D.Hy., D.P.H. London: J. A. Churchill Ltd., 1947. 409 pp. 82 ill.
- PROCEEDINGS OF A CONFERENCE ON INDUSTRIAL OPHTHALMOLOGY.** Sponsored by the Columbia University College of Physicians and Surgeons in Coöperation with the National Society for the Prevention of Blindness. New York: Columbia University Press, 1947. 291 pp. 56 ill. Price, \$3.00.
- PUBLIC HEALTH IN SEATTLE 1946.** Annual Report of the Department of Public Health. Emil E. Palmquist, M.D., M.P.H., Director of Public Health. Seattle: Department of Public Health, 1947. 124 pp.
- REPORT OF THE WORKING PARTY ON THE RECRUITMENT AND TRAINING OF NURSES.** Ministry of Health, Department of Health for Scotland. London, Eng.: His Majesty's Stationery Office, 1947. 122 pp. Price, 2s. 6d.
- RYPINS' MEDICAL LICENSURE EXAMINATION.** Edited by W. L. Bierring, M.D. (6th ed.). Philadelphia: Lippincott, 1947. 690 pp.
- A SCIENTIFIC BASIS FOR THE DESIGN OF INSTITUTION KITCHENS.** By Orpha Mae Huffman Thomas, Ph.D. New York: Teachers College, Columbia University, 1947. 75 pp. Price, \$3.00.
- SELECTED WRITINGS OF BENJAMIN RUSH.** By Dagobert D. Runes, Editor. New York: Philosophical Library, 1947. 433 pp. Price, \$5.00.
- SPORTS FOR THE HANDICAPPED.** By George T. Stafford (2nd ed.). New York: Prentice-Hall, 1947. 334 pp. 32 ill. Price, \$5.00.
- STUDY OF INDIVIDUAL CHILDREN'S DIETS.** Medical Research Council. Special Report 257. By E. M. Widdowson. London: His Majesty's Stationery Office, 1947. 196 pp. Price, 6s.
- SYNOPSIS OF OBSTETRICS.** By Jennings C. Litzenberg, B.Sc., M.D., F.A.C.S. (3rd ed.). St. Louis. Mosby, 1947. 416 pp. 157 ill. Price, \$5.50.
- A SURVEY OF THE EPIDEMIOLOGICAL SERVICES IN CANADA.** By D. F. Milam, M.D., and W. A. McIntosh, M.D. Toronto, Canada: The Rockefeller Foundation, 1947. 57 pp.
- VICTORIAN ORDER OF NURSES FOR CANADA. Fiftieth Anniversary.** By John Murray Gibbon. Ottawa, Canada: Victorian Order of Nurses for Canada, 1947. 124 pp. 32 ill. Price, \$2.00.

## A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

**When Johnny Comes Marching Home**—We tend to think of our recent increase in birth rates as phenomenal, but some of the other countries make our 1946 rate of 23 appear to be something less than colossal. Canada's rate was 26, South Africa's (White) 27, and the Netherlands 30—not to mention Venezuela's 38 and Mexico's 42.

**ANON.** World-Wide Resurgence in Birth Rates. Statistical Bull. (Met. Life Ins. Co.) 28, 9:1 (Sept.), 1947.

**Gourmets in the Making**—Don't call it "self-demand." Instead, say "self-regulation" while assessing the virtues of feeding babies when they tell you they are hungry. Less than 1 per cent of the tikes who were allowed to

choose their meal times failed to do as well as most clock-fed infants.

ALDRICH, C. E. and HEWITT, E. S. A Self-Regulating Feeding Program for Infants. J.A.M.A. 135, 6:340 (Oct. 11), 1947.

**How's Your Vocabulary?**—If you can rattle off a concise and exact definition of every word in the title of this paper, then it is possible that you will not need to review it. But if some of the words stump you, then you may add a little to your tiny store of understanding—providing you have a dictionary handy—by reading it. Any comment here on the whole paper would be as hopelessly inadequate as it would be presumptuous.

AYCOCK, W. L. and CURLEY, F. J. Variolation as a Principle: Immunization in Experimental Poliomyelitis with Active Virus Under Autarceologic Protection of Estrogenic Substance. Am. J. M. Sci. 214, 2:128 (Aug.), 1947.

**Hope of the World**—Though the human race is threatened as never before, science—given sufficient freedom—can be of real use in charting the world's course. So asserts the Executive Secretary of WHO.

CHISHOLM, B. On the March for Mental Health. Survey Graphic 36, 10:509 (Oct.), 1947.

**Department of Applied Humility**—Probably the greatest benefit you will derive from reading this paper will be a wholesome appreciation of what we have still to learn about the science of nutrition. You will "lay down the law" about family dietetics a little less *ipse dixit*-edly if you will expose your mind to this review article.

ELVEHJEM, C. A. and KREHL, W. H. Imbalance and Dietary Interrelationships in Nutrition. J.A.M.A. 135, 5:279 (Oct. 4), 1947.

**Second Thought Division**—Do you remember, in the December, 1946, bibliography, an annotation on a study of the possible direct relationship be-

tween caries and poliomyelitis? Polio patients were said to have twice as many carious teeth (with pulp exposed) as did "comparable" controls. The comparability of the controls has since been questioned. Now comes a new study reporting the finding that the incidence of exposed pulp was essentially the same in polio patients as it was in their siblings who had escaped the disease.

FINN, S., *et al.* Exposed Dental Pulp as a Portal of Entry for the Virus of Poliomyelitis. Am. J. Hyg. 46, 2:177 (Sept.), 1947.

**This Is About Garbage**—If you have not already heard, you will probably hear, some alarm-viewer air his worries about the overloading of municipal sewage works by the growing use of household garbage grinders. In Washington, D. C., the city is planning to begin grinding large quantities of refuse. They figure that when all garbage is ground the sewage disposal plant can readily be increased to accommodate the added load and that it will cost about 8 cents per capita to dispose of domestic garbage in that way.

FUHRMAN, R. E. Garbage Grinding Planned for the District of Columbia. Sewage Works Engin. 18, 10:518 (Oct.), 1947.

**Top Notch**—In so far as the viruses are concerned it is not enough that circulating antibodies exist. To be effective the antibodies must be sufficient in power and in the right place and there at the right time to block invasion, says this researcher. This excellent paper discusses four groups of viruses. It is not an easy one to read but you really should try to assimilate it.

FRANCIS, T. Mechanisms of Infection and Immunity in Virus Diseases of Man. Bact. Reviews 2, 3:147 (Sept.), 1947.

**Forty Per cent Savings**—Four topical applications of 2 per cent sodium fluoride, preceded by dental prophylaxis are the minimum number needed to give maximum protection.

GALAGAN, D. J. and KNUTSON, J. W. The Effect of Topically Applied Fluorides on Dental Caries Experience. *Pub. Health Rep.* 62, 41:1477 (Oct. 10), 1947.

**Treat Instead of Treatment—**After two decades of thumbing the same old journals and skimming the same old subjects—served up usually in the same old plodding style—a mental astigmatism tends to set in. Then, suddenly appears something inspired, something to make this ancient skimmer see clear and straight again. Though said skimmer is not sufficiently the psychologist to be able to assure you that every pronouncement is “sterling” grade, he promises you that every paragraph is a treat.

MACKAY, R. P. The Neurologist Looks at Discipline. *J.A.M.A.* 135, 7:399 (Oct. 18), 1947.

**Paradox—**It may be, concludes this writer, that we have increased the incidence of poliomyelitis disease while cutting down the rate of infection through better hygiene and sanitation by moving the age of infection into the older age group.

NELSON, N. Susceptibility and Immunity in Poliomyelitis. *J. Immunol.* 56, 4:311 (Aug.), 1947.

**This You Should Know—**Here is a good, easy-to-grasp statement on the status of streptomycin in the treatment of tuberculosis. Streptomycin is a valuable adjuvant, with a suppressive effect. Because not all lesions are curable, and because of the toxicity of the drug it should not be used indiscriminately. Neither is it a substitute for bed rest and related treatment measures.

PYLE, M. M., *et al.* Streptomycin in the Treatment of Tuberculosis. *Pub. Health Nurs.* 39, 10:498 (Oct.), 1947.

**Q Fever—**An outbreak of Q fever occurred among packing house workers

whose gory jobs exposed them to spattered blood. There were no infections among the men who handled the sheep and calves before they were slaughtered, and ticks seemed to have played no part.

SHEPARD, C. C. An Outbreak of Q Fever in a Chicago Packing House. *Am. J. Hyg.* 46, 2:185 (Sept.), 1947.

**Three Pictures to Turn Your Stomach—**You will be cheered a little by this brief account of what some practical humanitarians propose to do about bettering the hideously insanitary folkways of China where open sewers still disfigure the main streets of great cities.

SNELL, J. R. Sewage Disposal in China a Major Problem for the Future. *Sewage Works Engin.* 18, 10:526 (Oct.), 1947.

**It Pays to Try Everything—**If fruit flies could carry polio virus, they might easily account for the spread of disease. That is clear, isn't it? Well, a beautifully controlled study was carried out. It indicated that fruit flies can be grossly contaminated with virus, but under any condition which might be duplicated in nature, the flies were unable to transfer the infection. So the answer is: fruit flies are of no epidemiologic importance.

TOOMEY, J. A., *et al.* Can *Drosophila* Flies Carry Poliomyelitis Virus? *J. Infect. Dis.* 81, 2:135 (Sept.-Oct.), 1947.

**Turning Point—**A year after Koch described the tubercle bacillus, experimenters began the attack on the disease with non-pathogenic competitors. Now, sixty-odd years later, we seem to be getting somewhere. This review of the long drawn and often disheartening battle, coming from the pen of the man who gave us streptomycin, is something you'll not want to miss.

WAKSMAN, S. A. Antibiotics and Tuberculosis. *J.A.M.A.* 135, 8:478 (Oct. 25), 1947.



*Standing, left to right: Dr. Oswald T. Avery, Dr. Lowell J. Reed, Dr. Thomas Francis, Jr., Dr. Homer Smith, Dr. Thomas Parran, Sir Wilson Jameson, Dr. George Baeher, and Dr. Reginald M. Atwater. Seated: Mrs. Albert D. Lasker and Dr. Alice Hamilton.*

## THE LASKER AWARDS FOR 1947

THE Lasker Awards of the American Public Health Association are presented annually by the Albert and Mary Lasker Foundation to men and women in the field of medical research and public health administration whose efforts have contributed to, or will in time result in, the vastly improved health status of the peoples of the earth. In addition, outstanding work or research done by large groups where it is impossible to single out any one individual, is honored.

The awards are given not only to honor the recipients and dramatize their accomplishments but also to arouse increased professional and public interest in medical research and public health administration and to aid in the rapid

dissemination of new medical information.

The Lasker Awards for 1947 were conferred on October 9, 1947, at the Second General Session of the 75th Annual Meeting in Atlantic City, N. J. Five individuals and two groups were honored. The beautifully illuminated citations read as follows:

To Oswald T. Avery, M.D., for studies on the antigenic constitution of bacteria.

With unusual persistence, remarkable insight and extraordinary accuracy of observation, Oswald T. Avery has devoted the greater part of his scientific career to the study of the pneumococcus.

Animated by an unsurpassed intellectual curiosity and a desire to conquer one of the most deadly enemies of man, he undertook to elucidate in logical sequence the biological

activities, the immunological characteristics, and the pathogenic properties of the pneumococcus. In this he so far succeeded that today it is fair to say that more is known about this organism than about any other human parasite.

Were this all it would be a unique accomplishment, but quite early in the course of his investigations he became interested in searching for a chemical explanation for the type-specificity of pneumococci. As a consequence, he discovered and identified the capsular polysaccharides and demonstrated their role in determining this specificity.

He furthermore succeeded in throwing light on the immunological relationships of the intracellular constituents of this organism.

Through these discoveries he laid the foundation for his brilliant analysis in chemical terms of the antigenic constitution of the whole pneumococcus. He thus established a perfect pattern for the antigenic analysis of other microorganisms both by himself and by others who have followed in his footsteps.

Among Dr. Avery's many brilliant contributions to scientific knowledge none has been more outstanding than his studies on the antigenic constitution of bacteria. Through them he is one of the founders of the science of immunochemistry. Because of them our comprehension of the complex problems of infectious disease has been immeasurably enriched.

To Thomas Francis, Jr., M.D., for distinguished services through contributions to our total knowledge of influenza.

Thomas Francis, Jr., is honored with The Lasker Award in recognition of his distinguished contribution to our knowledge of influenza, and his effective leadership in the world-wide fight against this scourge of mankind.

Dr. Francis's researches on influenza began about two decades ago. In 1928 he joined the staff of the hospital of the Rockefeller Institute, and in 1936 he organized for the International Health Division of the Rockefeller Foundation the influenza study laboratories where pioneer work was done on the etiology and epidemiology of the disease. In 1938 he became Professor of Bacteriology at New York University, and in 1941 he accepted the professorship of Epidemiology and Chairmanship of the Department of Epidemiology in the newly established School of Public Health in the University of Michigan. In 1947 Dr. Francis was appointed to a distinguished professorship at Michigan, known

as the Henry Sewell Professorship of Epidemiology.

Dr. Francis's contributions to scientific literature have been numerous and have brought him many honors. Since the first report in 1934 on the recovery of the virus of influenza A in the Western Hemisphere, which confirmed the primary observation of Smith, Andrewes, and Laidlaw, Dr. Francis's studies have included a series of immunological, epidemiological, and clinical observations directed toward a better understanding of the human disease. The demonstration with Magill of serological variations in strains has resulted in sustained studies of its significance in recurrent epidemics. The identification of influenza B and isolation of that virus added clarification to the problem by establishing a new entity in a complex field. His continuous investigations have contributed much to our knowledge of the global aspects of the disease.

Studies of the selective action of influenza virus on the respiratory epithelium and of antibodies in the respiratory secretions have given insight into the mechanisms of infection and immunity. From the original demonstration in 1936 that influenza virus given subcutaneously or intradermally could induce the formation of antibodies in man, successive studies have brought evidence in controlled observations of the effectiveness of human immunization against influenza.

As Director of the Commission on Influenza of the Army Epidemiological Board, Dr. Francis organized and actively participated in the establishment of "listening posts" for the detection of influenza in various parts of the United States, and in the Army studies which gave evidence that vaccination can be effective against epidemic influenza A and influenza B.

Thus Dr. Francis, through his own contributions and through his stimulation of other investigators, has made a notable contribution to our knowledge of influenza which affords a sound foundation for future work, and has created the hope that this disease may be eventually conquered.

To Homer Smith, D.Sc., for distinguished services through conclusive studies on cardiovascular and renal physiology.

Homer Smith is honored for his distinguished contributions in the fields of renal and vascular physiology.

His work falls into a unique and logical pattern. Early fundamental studies upon osmotic regulation in fish provided a basis for



a masterly analysis of the available data in the formulation of a theory of the evolution of the mammalian kidney.

Within this frame, he has been led to a fruitful investigation of the specific activities by which the mammalian kidney performs its regulatory duties. Unalterably opposed to the "unphysiological preparation" in experimentation, he devised simple tests by which glomerular filtration rate, renal blood flow, and renal tubular capacities might be measured quantitatively without pain, operative procedures, or anesthesia.

These tools of investigation are applicable in the study of man, and under Dr. Smith's direction, they have been energetically employed in man in clarifying problems of renal function in health and disease.

These studies are masterpieces of clinical investigation, sparkling with new concepts, gracefully phrased and logically developed. They have thrown new light upon the problems of renal and cardiorenal diseases, which are at present the chief causes of death, and have provided the background for many future investigations in this important field of medicine and public health.

Homer Smith has also been prominent among those responsible for the physiological bearing of the current trend in medical thinking. In part this influence springs from the character of the man.

Modest, self-effacing, and consecrated to his work, he does not shun the fight for what he considers is right, fair, and just. In paying tribute to his work, we pay homage to the man.

To Alice Hamilton, M.D., for an inspiring life of public service in the prevention of occupational disease.

To Dr. Alice Hamilton, pioneer American leader in industrial toxicology, for her contribution to the development of public health methods in industry, and to the prevention of occupational diseases.

After graduating in medicine at the University of Michigan in 1893, and postgraduate studies in Germany, Dr. Hamilton returned to the United States intending to specialize in bacteriology, pharmacology, and toxicology.

Because of her growing interest in social progress and labor reform, which increased through her friendship with Jane Addams and her associates at Hull House, Dr. Hamilton began to specialize in industrial medical problems shortly after the turn of the century. At that time industrial medicine was not yet considered a specialty, and the need for

physicians in industry was not generally recognized.

Through her efforts to prevent lead poisoning, "phossy jaw" in the match industry, mercury poisoning, TNT poisoning in World War I, and her later investigations of benzol, carbon disulfide and other organic solvents, she has contributed much to the control of these hazards and to the establishment of the profession of industrial preventive medicine in this country.

Throughout her useful life Dr. Hamilton has worked to improve the health of human beings. She has helped the laborer, the unions, the large manufacturers, the universities, and the government, and all her investigations have been carried out with complete objectivity and fearless candor. She has never been either pro labor or pro capital, but has stood unwaveringly for the betterment of the worker's health.

Dr. Hamilton has been associated with many educational institutions, and the excellence of her contributions has been widely recognized by her scientific associates. After 26 years of service, she is now retired as one of the Emeritus Professors of the Harvard School of Public Health.

This Lasker Award is given to Dr. Hamilton in recognition of her outstanding accomplishments in industrial toxicology, and for the inspiration she has afforded to all those who are interested in industrial preventive medicine and world health.

To Thomas Parran, M.D., for outstanding contributions to the national health and to the World Health Organization.

Dr. Thomas Parran has achieved worldwide acclaim for his dynamic leadership in public health administration as well as for his successful pioneering against preventable disease. He is also the great advocate of support for medical research before the Congress and the American people.

Dr. Parran's public health service career has been a succession of striking achievements. It began during World War I with responsibility for extra-cantonment sanitation in an industrial city and its environs. He then organized county health work in the rural areas of several states, headed a sanitary district in a mining area, served as chief of rural sanitation activities in another state. He was Assistant Surgeon General of the U. S. Public Health Service in charge of the Division of Venereal Disease in its early days.

In 1930, he was loaned by President Hoover to Governor Roosevelt to become Commis-

sioner of Health of the State of New York, where he served with distinction for six years. For the past eleven years, he has served as Surgeon General of the U. S. Public Health Service.

In 1946, he was president of the International Health Conference of delegates from seventy nations, which resulted in the establishment of the World Health Organization of the United Nations. Since then, he has been the United States Delegate to the Interim Commission of the World Health Organization.

Throughout his brilliant public health career, Dr. Parran's activities have been significantly characterized by the qualities of judgment, enthusiasm, courage, decisiveness, and vision.

This has been especially true of his forthright approach to the control of the venereal diseases, which began with the breakdown of public prejudice against the use of the terms "syphilis" and "gonorrhea."

This was followed by successive steps leading to the appropriation of federal grants-in-aid to the states, and the eventual establishment of rapid treatment centers throughout the land. If syphilis is finally wiped out in this country, it will be due to Dr. Parran's consistent courage and statesmanship, as much as to the discovery of a curative drug.

With a vigorous originality of approach, he has developed new concepts of health services for the American people and the world. In addition, he has been able to secure the understanding and interest of the people and the support of their elected representatives. He has contributed substantially to the development of the World Health Organization, important both because of its life-saving mission and because it may prove to be a "rallying point of unity" in international affairs.

As Dr. Parran himself recently said in a foreword to a summary of the history of the World Health Organization—"We in the United States must carry on two major jobs at once—we must maintain a place of leadership in world health affairs and at the same time redouble our efforts to attain a more comprehensive health program at home. We are faced with great opportunities for service to humanity."

In recognition of these and other services to the people of America and the world, the Lasker Awards Committee of the American Public Health Association has recommended that a Special Award be made this year to Dr. Parran, which will express the appreciation of this Association for his inspiring public

health leadership in domestic and world affairs.

To the British Ministries of Food and Health, for the unprecedented program of food distribution in Great Britain, with resulting improvement in the health of the people.

Long before World War II, the Medical Research Council and the health authorities of Great Britain had been active in promoting research and in spreading knowledge of nutrition among the people.

In 1937 an Advisory Committee on Nutrition was set up by the British Ministry of Health which undertook a survey of the national diet. The background had therefore been developed before the outbreak of the war for the first large-scale application of the science of nutrition to the population of the United Kingdom. A separate Ministry of Food was established with wide executive powers over the production and rationing of foods, the purchase of foods from abroad, and the education of the public in the proper use of available foods. By the effective employment of its great powers, the Ministry of Food, in consultation with the Ministry of Health and with the advice (on all matters which might affect the health of the people) of a Standing Committee under the chairmanship of the Chief Medical Officer, succeeded to a remarkable degree in providing a diet for all the workers of the country in conformity with their physiological requirement, irrespective of income.

Although almost all other environmental factors which might influence the public health deteriorated under the stress of war, the public health in Great Britain was maintained and in many respects improved. The rates of infantile, neonatal and maternal mortality and of stillbirths all reached the lowest levels in the history of the country. The incidence of anemia and dental caries declined, the rate of growth of school children improved, progress was made in the control of tuberculosis, and the general state of nutrition of the population as a whole was up to or an improvement upon pre-war standards.

In the opinion of the Lasker Awards Committee, this has been one of the greatest demonstrations in public health administration that the world has ever seen. The Lasker Awards Committee of the American Public Health Association therefore takes great satisfaction in recommending awards for scientific and administrative achievement to

the British Ministries of Food and Health and to the four great leaders in this historic enterprise. Lord Woolton, Sir Jack Drummond, Sir Wilson Jameson, and Sir John Boyd Orr.

(Sir Wilson Jameson received the award on behalf of the group.)

To the United States Committee on Joint Causes of Death, for significant contributions to the international classification of diseases, injuries, and causes of death.

The Lasker Award of the American Public Health Association represents the appreciation of the workers in public health and medical care for the scholarly achievement of the United States Committee on Joint Causes of Death under the chairmanship of Dr. Lowell J. Reed. The work of this committee will greatly facilitate the exchange of statistical information on health and medicine between the countries of the world, and serve as one of the effective links in binding them together under the banner of the United Nations.

Although early classification of the causes of death for statistical purposes goes back to the great English medical statistician, William Farr (1855), the first international conference for the revision of the *International List* was called by the French Government in Paris in the year 1900, at which time the guiding force was Dr Jacques Bertillon. There was early recognition of the need for an international list of the causes of illness to facilitate the collection and exchange of information by all the countries of the world, supplementing the causes of mortality.

At the Fifth International Conference held in Paris in 1938 to revise the *International List*, the United States Government was requested officially to continue the previous studies of the Committee on Joint Causes of Death and to extend it into the field of morbidity classification. In 1945 the Secretary of State appointed the United States Committee on Joint Causes of Death to carry out this charge. The committee included representatives of the Canadian and British Governments and the Health Section of the League of Nations as associates or consultants and was headed by Dr. Reed, Vice-President and Professor of Biostatistics at the Johns Hopkins University.

Under Dr. Reed's inspired leadership and with the coöperation of its British and Canadian associates the committee accomplished its task successfully. A preliminary draft of the proposed statistical classification of diseases, injuries, and causes of death was then subjected to trials and reviews of various agencies and individuals in England, in the United States, and in Canada. The United States Committee met in Ottawa in March, 1947, with the International Committee which has been appointed to prepare for the 6th decennial revision of the *International List of Causes of Death*, and at this time the work of the United States Committee was adopted by the International Committee as the basis for its recommendations to the nations of the world when their representatives reconvene in Paris in 1948 for the purpose of revising the *International List*.

(Dr. Lowell J. Reed received the award on behalf of the group.)

## ASSOCIATION NEWS

### Martha M. Eliot, M.D., President of American Public Health Association

Dr. Eliot, a native of Dorchester, Mass., was graduated from Radcliffe College, Cambridge, Mass., in 1913, and received her M.D. degree from Johns Hopkins University in 1918. After an internship at the Peter Bent Brigham Hospital in Boston, Dr. Eliot served a pediatric residency at the St. Louis Children's Hospital and worked in the same field at the Massachusetts General and the New Haven Hospitals. She became identified with the Department of Pediatrics at Yale in 1921, advancing to the rank of Associate Clinical Professor and Attending Pediatrician of the New Haven Hospital and New Haven Dispensary.

Best known because of her relationships with the U. S. Children's Bureau, Dr. Eliot served as Director of the Division of Child and Maternal Health, 1924-1934, and was Assistant Chief of the Children's Bureau 1934-1941. Since May, 1941, she has been Associate Chief. Most recently Dr. Eliot on loan from the Children's Bureau has served as Chief Medical Consultant of the International Children's Emergency Fund of the United Nations, during which service she has made several trips to Western and Central Europe.

Dr. Eliot's professional connections include Fellowship in the American Public Health Association, in the American Medical Association, membership

in the American Academy of Pediatrics, in the American Institute of Nutrition, and in the American Pediatrics Society. She also is identified with the Society



*Martha M. Eliot, M.D.*

for Research in Child Development and has published widely in the field of nutrition and especially of rickets. She was inducted into the Presidency of the Association on October 10, 1947, at the close of the 75th Annual Meeting, and carries the honor of being the first woman elected to this office.

### Sedgwick Memorial Medal for 1947 Awarded to Dr. Atwater

THE award of the Sedgwick Memorial Medal of 1947 was made on November 7 during the Seventy-fifth Annual

Meeting in Atlantic City, N. J., to Reginald M. Atwater, M.D., Executive Secretary of the Association. It was

presented by the Chairman of the Sedgwick Memorial Medal Committee, Brigadier General James Stevens Simmons, U.S.A. (Retired), Dean of Harvard School of Public Health. The citation follows:

The award of the Sedgwick Memorial Medal is the highest honor which can be conferred by this Association. This medal has been awarded to distinguished investigators in the field of laboratory science, to epidemiologists, to college professors, to the administrative officers of national and local health services.

The man selected to receive this award for 1947 could qualify on two of these grounds. He has been a teacher at the Hunan-Yale College of Medicine in Changsha, and at the Harvard School of Public Health. He was a health officer for eight years and directed the notable health demonstration at Cattaugus County, N. Y. In particular, however, we honor him today for the "Distinguished Service in Public Health" which he has rendered as Executive Secretary of the American Public Health Association.

We need executive leadership of the finest type in our local and state and federal health departments, and in the voluntary agencies which must play an increasingly important rôle in our program of total war against disease. We need it also in the American Public Health Association itself, the one organization which represents the public health profession as a whole and has done so much to develop and to integrate its program. We celebrate this year the Seventy-fifth birthday of the Association. We review with pride the vision of Stephen Smith and his associates who founded this organization in 1872. We rejoice in the fact that this is no narrow national body; Canada, Cuba, and Mexico are equal members with the United States. Our Association represents the whole North American Continent. We are proud of its

11,000 members, its admirably planned meetings, and its JOURNAL. We recall with satisfaction the accomplishments of its major standing committees; the Committee on Research and Standards, which is responsible for our authoritative reports on standard methods; the Committee on Administrative Practice, which has provided sound objective methods of evaluating health department procedures and a concrete plan for developing local health units; and the Committee on Professional Education, which has furnished wise leadership in stimulating training and furthering the sound selection of professional personnel.

No one could be more pleased than William T. Sedgwick, if he could observe the progress of the Association along these lines. He was a moving force in the creation of the Laboratory Section as the first specialized Section of the Association nearly half a century ago. He was a loyal and an ardent member, and encouraged his students to join the American Public Health Association and to serve it with similar devotion. I know that I speak for him when I present the Sedgwick Medal to Rex Atwater.

The Association has grown in size and in capacity for service more during the last twelve years than in the earlier six decades of its history; and that growth has been largely due to its Executive Secretary.

In this difficult task he has shown wisdom of rare quality in dealing not only with administrative problems but with the broad policies of a profession which is today inevitably entering new and controversial fields. His wisdom has been inspired by unflinching courage which has faced decisions without any fear of personal consequences. His firmness in matters of principle has been tempered by unfa'ling patience and by an essential humanity which has earned not only our respect but our personal affection. He has served the cause of

public health with complete devotion and with a modesty that has often hidden the crucial part he has played in forming the program and policies of the organization.

This modesty led him to protest the unanimous decision of the Sedgwick Award Committee and to say that he felt that the Medal should not be given to an executive officer of the American Public Health Association. He remarked that such executives were only doing their duty.

This same modesty, SIR, will no doubt cause you to say that the Sedgwick Award for 1947 is an award to the American Public Health Association as well as to yourself. That is, in a measure, true; but it has been well said that great events are the shadows of great men. In the name of William T. Sedgwick and of the American Public Health Association I hand to you, Dr. Atwater, the Sedgwick Memorial Medal "FOR DISTINGUISHED SERVICE IN PUBLIC HEALTH."

In accepting the award, Dr. Atwater responded as follows:

This is a highly appreciated honor, General Simmons, which you and the Committee have conferred upon me. I prize it as a recognition that the operation of our professional society is an important factor in the progress of public health. It thus has a part along with research and teaching and public administration where all the previous recipients have been engaged.

The American Public Health Association is indeed a wonderful fellowship to which I owe much as a result of these years of close identity. I am grateful for the privilege of serving for a period which represents just one-sixth of the time since the founding of the Association. It has indeed been a priceless opportunity to know the giants in our field of service.

After all, as Winslow has so well said,

the purpose of this award is not primarily to place each year a crown on the brow of a more or less worthy recipient. The purpose is to keep the laurel green on the memory of a great pioneer in American public health. William Thompson Sedgwick was a human being whose personality, whose soul, was far more significant than any or all of his concrete achievements.

It is altogether fitting that the memory of a great teacher should be perpetuated by his colleagues so that succeeding generations may understand something of the spirit and the quality of the man. One of Professor Sedgwick's friends wrote, "There was something cumulative in the good he wrought, so that the sense of his worth came unawares upon one like the approach of morning. Beyond the immediate friendliness of the man lay a constancy and fulness of good will that was impersonal and really great, measurable only as it is withdrawn."

Other recipients of the Sedgwick Medal have recorded the extent of the influence which he had on them as teacher and friend over many years. My own direct contact was condensed into a single lecture which I heard him give to the students of the Harvard-M.I.T. School of Public Health. Yet from that single occasion I retain after 30 years a lively sense of his personality and power and I welcome this opportunity of acknowledging an unpayable debt. The 26 years which have elapsed since the untimely death of Professor Sedgwick have allowed us to appreciate the real stature of a great man. His imprint upon the American Public Health Association may still be readily discerned. He knew the quality of effort that went into the foundations. He must have pleasure in the progress that has been recorded in these years since he left us.

The foundations which Professor Sedgwick built into the Association

were solid and durable. He served the Association long and well, being President in 1915. The contributions which he made to the *American Journal of Public Health* are specially meaningful to me. I am told that for several years, beginning about 1915, every issue of the *Journal* printed was personally underwritten by Professor Sedgwick who guaranteed the bill with the printer. So he not only motivated the *Journal* in its policy and content but he added a very practical support without which publication would have been impossible!

An executive of a professional society who receives such an award will know as I know that any success which he has attained goes back in largest measure to the colleagues among whom he spends his life. It is they who make success

or failure for such a society as this. At best the executive can only create a favorable climate. Behind these staff associates, of course, stand the chairmen and the members of about 100 committees who have faithfully labored that the American Public Health Association might live.

It is proper, therefore, that such an award should be accepted on behalf of these faithful Fellows and members of the Association and also on behalf of a loyal staff without whose patient labors and outstanding teamwork it would all fail. In their name and in recognition of their fine support I am proud to accept this award. I hope that as we deal with students today we may help them to be as useful as Sedgwick's students have been.

## RESOLUTIONS

THE following Resolutions were unanimously adopted by the Association at the Seventy-fifth Annual Meeting in Atlantic City, N. J., October 8, 1947:

### 1. APPRECIATION TO OFFICIALS AND GROUPS

RESOLVED that the American Public Health Association expresses its grateful appreciation to the New Jersey Committee and the agencies represented thereon for their gracious hospitality, and be it further

RESOLVED that the warm thanks of officers and members be extended to Samuel L. Salasin, M.D., General Chairman of the New Jersey Committee and his colleagues on the Committee for their many courtesies and their efficiency in making provisions for this meeting and in the conduct thereof.

### 2. THANKS TO THE AUDITORIUM AND HOTELS

RESOLVED that the American Public Health Association expresses its ap-

preciation to the Convention Hall and to the Hotel Ambassador for their valuable assistance in the conduct of the Seventy-fifth Annual Meeting.

### 3. APPRECIATION TO THE PRESS

RESOLVED that the American Public Health Association acknowledges its indebtedness to the press, national, state, and local, for excellent service in connection with the Seventy-fifth Annual Meeting.

### 4. APPRECIATION TO EXHIBITORS

RESOLVED that the American Public Health Association expresses its grateful appreciation to those who have presented at its Seventy-fifth Annual Meeting the excellent exhibits, both scientific and technical, which are of such great interest and value to the public health profession.

## 5. IN MEMORIAM

RESOLVED that it is with a sense of irreparable loss that the American Public Health Association records,

since its last Annual Meeting, the death of fifty-seven fellows and members, the names of whom constitute a part of this resolution.

*Deceased Members and Fellows of the American Public Health Association  
November, 1946, to October, 1947*

NAME	ELECTED	
	MEMBER	FELLOW
Martin Bernfield, M.D., San Antonio, Tex.	1940	
James C. Boland, M.D., Troy, N. Y.	1936	
Frederick E. Bolt, M.D., Worcester, N. Y.	1924	
Frank J. Brands, Brooklyn, N. Y.	1937	
Claude M. Cook, M.D., Danville, Ill.	1941	
Cathlena A. Cooper, Syracuse, N. Y.	1940	
Porter J. Crawford, M.D., Havana, Cuba	1926	1935
Robert L. Crockett, M.D., Oneida, N. Y.	1915	
Dr. D. S.K.Dai, Chengtu, Szechwan, China	1945	
Andrew H. Dibble, M.D., Louisville, Ky.	1946	
Judson D. Dowling, M.D., Menton, Ala.	1930	1936
J. Cyril Eby, M.D., Plaquemine, La.	1930	
Wendell J. Erickson, Albany, N. Y.	1938	
William G. Exton, M.D., Newark, N. J.	1932	
Guy H. Faget, M.D., Carville, La.	1947	
F. E. Fernandez-Garcia, M.D., Habana, Cuba	1938	
Prof. Irving Fisher, New Haven, Conn.	1903	1922, Charter Fellow, Life Member, Forty-year member
Mary C. Fulton, R.N., Evanston, Ill.	1941	
Mrs. Ruth G. George, R.N., Columbia, S. C.	1937	1944
W. V. Halversen, Ph.D., San Jose, Calif.	1940	
F. E. Harrington, M.D., Minneapolis, Minn.	1916	
Adah L. Hershey, R.N., Des Moines, Iowa	1920	1934
Dorcas O. Hoge, Grand Island, Nebr.	1935	
William Hogan, Pasadena, Calif.	1947	
Vernon D. Irwin, D.D.S., Minneapolis, Minn.	1937	
Eduardo Joubanc, Tampico, Tamaulipas, Mex.	1947	
Arthur D. Knott, M.D., D.P.H., Camilla, Ga.	1924	1933, Life Member
Bernard V. Lally, M.D., Tiffin, Ohio	1946	
Charles J. Larkey, M.D., Bayonne, N. J.	1919	
John H. Law, M.D., Detroit, Mich.	1946	
Walter S. Lay, M.D., Hamden, Conn.	1941	
Edward M. L'Engle, M.D., Jacksonville, Fla.	1937	
Leslie L. Lumsden, M.D., New Orleans, La.	1909	
Clarence H. Mackey, M.D., Lancaster, N. Y.	1920	
P. P. McCain, M.D., Sanatorium, N. C.	1924	
W. M. McKay, M.D., Salt Lake City, Utah	1937	
Thomas H. Milford, Montgomery, Ala.	1943	
Ira C. Miller, M.D., Camp Hill, Pa.	1939	
Major W. C. Mooney, Vancouver, B. C. Can.	1945	
S. Morris, Ph.D., St. Thomas, Virgin Islands	1945	
Harry J. Nestlebusch, St. Joseph, Mo.	1938	
Fred L. Ogilvie, M.D., Caruthersville, Mo.	1941	
Charles A. O'Quinn, M.D., Perry, Fla.	1940	
Horatio N. Parker, Jacksonville, Fla.	1900	1922, Charter Fellow, Forty- year Member



*Deceased Members and Fellows of the American Public Health Association  
November, 1946, to October, 1947 (Cont.)*

NAME	ELECTED	
	MEMBER	FELLOW
G. T. Parkinson, M.D., Twin Falls, Ida.	1942	
Karel C. Pur, M.D., Brno, Czechoslovakia	1947	
Mrs. Mary C. Robinson, Yuma, Ariz.	1938	
Anton R. Rose, M.D., Ph.D., Newark, N. J.	1924	
Ara N. Sargent, M.D., Salem, Mass.	1918	
Walter Schilling, M.D., San Francisco, Calif.	1947	
Frithjof Setter, Ph.D., Detroit, Mich.	1946	
Amanda M. Sheeler, R.N., Lansdowne, Pa.	1932	
Courtney Smith, M.D., Dr.P.H., Wash., D. C.	1937	1942
Sam Sparhawk, M.D., Chehalis, Wash.	1946	
Bert L. Stinson, M.D., Homer, La.	1936	
Robert G. Townsend, Lincoln, Nebr.	1946	
James E. Wolfe, M.D., Wichita, Kan.	1942	

#### 6. INTERNATIONAL FOOD EMERGENCY

WHEREAS, the spectre of hunger and disease in widespread areas of Europe stands in the way of orderly progress toward a stable world order; and

WHEREAS, the United States of America is one of the few fortunate nations that can divert substantial quantities of food from livestock feeding, industrial use, and direct consumption without sacrifice to the health of our citizenry; therefore be it

RESOLVED the American Public Health Association pledges its full support to official and voluntary measures to bring relief to the stricken countries of Europe.

#### 9. RESOLUTION ON THE INTERNATIONAL CHILDREN'S EMERGENCY FUND OF THE UNITED NATIONS

WHEREAS, the United Nations, to aid in meeting the emergency situation of child health and welfare in many countries has established the International Children's Emergency Fund as an agency of the United Nations, and

WHEREAS, substantial evidence exists that there is widespread undernutrition and other threats to child health, and that the governments of the countries involved are without adequate means to combat these conditions, and

WHEREAS, the International Children's Emergency Fund has projected programs of child feeding and child health which are properly designed to meet a primary emergency child health problem, and

WHEREAS, the International Children's Emergency Fund is effectively coordinating its work and cooperating in practical ways with the Interim Commission of the World Health Organization, The Food and Agriculture Organization and other United Nations organizations concerned, and is developing the coordination of voluntary effort as well as that of governments, be it

RESOLVED, that the American Public Health Association approves the program of the International Children's Emergency Fund and urges that it receive full and immediate support of the government and people of the United States.

#### 10. PREVENTION OF PREMATUREITY

WHEREAS, prematurity ranks first in the causes of infant mortality and is among the ten leading causes of death in the nation as a whole, be it therefore

RESOLVED that the American Public Health Association respectfully directs the attention of state and municipal authorities to this situation and

recommends appropriations for a program for the prevention of prematurity and for the provision of facilities for the adequate care of premature infants.

#### 11. OLEOMARGARINE

WHEREAS, generally rising prices of essential foods constitutes a serious threat to the nutrition and well-being of the American People, and

WHEREAS, butter and other fats, important dietary essentials, have been in the foreground of these price rises, and

WHEREAS, scientific evidence has shown

that fortified oleomargarine supplies the food factors usually expected of butter, and

WHEREAS, present federal and state taxes on oleomargarine seriously raise the retail price of this commodity, thus violating the principle that government should facilitate rather than hinder the provision of a satisfactory diet for all the people, be it therefore

RESOLVED that the American Public Health Association condemns specific taxes on oleomargarine, and respectfully petitions the Congress and the various State Legislatures to repeal these taxes.

### APPLICANTS FOR MEMBERSHIP

*The following individuals have applied for membership in the Association. They have requested affiliation with the Sections indicated.*

#### *Health Officers Section*

Owen F. Agee, M.D., 1828 Audubon St., New Orleans, La., Acting Director, Division of Local Health Service, State Dept. of Health  
 Mario Batinga de Araujo Lessa, M.D., Servico Especial de Saude Publica, Caixa Postal 621, Belem, Para, Brazil, S. A., Physician  
 Sarah H. Bowditch, M.D., 60 Mount Vernon, Boston, Mass., Student, Harvard School of Public Health  
 Terrell O. Carver, M.D., 203 Civil Courts Bldg., New Orleans, La., Acting Chief, Tuberculosis Control Section, State Health Dept.  
 C. Gopalraj Chetty, M.B., D.P.H., 382 Longwood Ave., Boston 15, Mass., Student, Harvard School of Public Health  
 John L. Crawford, M.D., 55 Shattuck St., Boston, Mass., Student, Harvard School of Public Health  
 Leonard H. Denny, M.D., 301 S. Greene St., Portsmouth, Va., City Health Officer  
 Gordon C. Edwards, M.D., M.P.H., 870 S. W. Cheltenham St., Portland 1, Ore., Director, Division of County Health Units Administration, State Board of Health  
 Richard V. Fellers, Dept. of Health, Nutley, N. J., Health Officer  
 Norvin C. Kiefer, M.D., M.P.H., 4602 Cheltenham Drive, Bethesda, Md., Senior Surgeon; Asst. to the Chief, Tuberculosis Control Division, U. S. Public Health Service  
 Allen C. Neiswander, M.D., 402 S. Greenleaf,

Whittier, Calif., District Health Officer, Los Angeles County Health Dept.  
 Michael Nittoli, 700 E. Jersey St., Elizabeth, N. J., Health Officer  
 S. A. Porter, M.D., Okanogan Health Dept., Okanogan, Wash., Health Officer  
 Konstantin K. Sparkuhl, M.D., M.P.H., 1923 E Monument St., Baltimore 5, Md., Health Officer, Eastern Health District  
 Oscar D. Stryker, M.D., County Bldg., Mt. Clemens, Mich., Director, Macomb County Health Dept.

#### *Laboratory Section*

Esther L. Bruegger, 716 W. Michigan Ave., Lansing 15, Mich., Bacteriologist, State Dept. of Health  
 Birdsall N. Carle, D.V.M., M.D., National Institute of Health, Bethesda, Md., Senior Assistant Surgeon, U. S. Public Health Service  
 Joan B. Daniels, 96 York Terrace, Brookline, Mass., Asst. Bacteriologist, State Dept. of Public Health  
 Margaret Ewing, County Public Health Laboratory, City Hall, Eureka, Calif., Bacteriologist, Humboldt County Dept. of Public Health  
 Thomas F. Gavin, 5821 Market St., Philadelphia 39, Pa., Hartman-Leddon Co. (Manufacturers of Laboratory Reagents Specialties)  
 Emil Kotcher, Sc.D., 101 W. Chestnut St.,

Louisville 2, Ky., Assoc. Professor of Bacteriology, Univ. of Louisville, School of Medicine

John W. Krasauskas, M.S., 6034 Eastern St., N. E., Washington 11, D. C., Bacteriologist, Corps of Engineers

Harry E. Ohl, M.D., General Delivery, Angwin, Calif., Student

Lt. Col. Harold E. Shuey, M.C., 3rd Army Area, Medical Lab. Area, Ft. McPherson, Ga., Commanding Officer

#### *Vital Statistics Section*

Lillian R. Elveback, 910 Riverside Drive, New York 32, N. Y., Instructor in Biostatistics, School of Public Health, Columbia Univ.

Sarah K. McCracken, M.A., 314 Health Bldg., Durham, N. C., Exec. Secy., Durham County Unit, American Cancer Society

Orville B. Bailey, 1326 "O" St., Sacramento, Calif., Senior Statistician, State Dept. of Employment

Charles Uomini, 6387 Mission St., Daly City 25, Calif., Public Health Analyst, San Mateo County Dept. of Public Health and Welfare

Jack R. Vermillion, 1471-43rd Ave., San Francisco 22, Calif., Senior Public Health Analyst, State Dept. of Employment

Margaret West, Wheaton Rd., Kensington, Md., Public Health Analyst, U. S. Public Health Service

#### *Engineering Section*

Clarence W. Clark, 1022 S. W. 11th Ave., Portland 5, Ore., Chief, Motor Court and Campground Section, Division of Sanitary Engineering, State Board of Health

William G. Crye, Jr., Box 102, Monticello, Fla., Sanitary Officer, Jefferson County Health Unit

Henry E. Drümwright, 1326 Arizona, Dallas, Tex., Chief, Public Health Inspection Service, City Health Dept.

Philip Gorlin, 263 Remsen Ave., Brooklyn 12, N. Y., Health Inspector, New York City Dept. of Health

Vernon L. Harris, State Health Dept., Boise, Ida., Hospital Project Supervisor, State Dept. of Public Health

Frederick W. Luehring, Ph.D., Univ. of Pennsylvania, Philadelphia, Pa., Professor, Dept. of Physical Education

Mitchell P. Mondala, 3538 E. 87th St., Seattle 5, Wash., Advisory Sanitarian, State Dept. of Health

John L. Porter, 8407 Panola St., New Orleans 18, La., Asst. Director, Division of Public Health Engineering, State Board of Health

Armin A. Roth, 21551 Garrison, Dearborn, Mich., Public Health Engineer, Food and Beverage Division, Wyandotte Chemicals Corp.

John H. Wyma, 508 Grant St., Grand Haven, Mich., Chief Sanitarian, Ottawa County Health Dept.

#### *Industrial Hygiene Section*

B. N. Lingaraju, M.B., D.P.H., 55 Shattuck St., Boston 15, Mass., Student, Harvard School of Public Health

Marie A. Sena, M.D., M.S.P.H., 561 S. Orange Ave., Newark, N. J., Coördinator of Adult Health Activities, State Dept. of Health

#### *Food and Nutrition Section*

Ada E. Dean, R.N., 411 Cedar St., Takoma Park, Washington 12, D. C., Medical Secretary, Potomac Conference of Seventh-day Adventists

Alice G. Keaton, State Board of Health, Jackson, Miss., Director, Nutrition Services

Lionel B. Pett, M.D., Dept. of National Health and Welfare, Ottawa, Ont., Canada, Chief, Nutrition Division

#### *Maternal and Child Health Section*

Eunice E. Bryan, M.D., Division of Social Administration, Oak and 9th, Columbus 15, Ohio, Medical Director, Services for Crippled Children, Ohio Dept. of Public Welfare

Ella L. Peters, M.D., M.P.H., 320 Sherbrook St., Winnipeg, Manitoba, Canada, Director of Maternal and Child Hygiene, Dept. of Health and Public Welfare

Madeleine Y. Phaneuf, R.N., 213 Civil Courts Bldg., P. O. Box 630, New Orleans 7, La., Hospital Nursing Consultant, State Dept. of Health

#### *Public Health Education Section*

Katharine R. Adams, M.S.P.H., 312 Oakland Ave., Rock Hill, S. C., Head, Dept. of Health Education, Winthrop College

J. Robert Anderson, M.A., State Health Dept., Richmond, Va., Director of Health Education

Roland H. Berg, 119 Bank St., New York 14, N. Y., Director, Scientific Information, National Foundation for Infantile Paralysis, Inc.

Morey R. Fields, Ed.D., 35-41 West Fourth St., New York, N. Y., Asst. Professor in Education, New York Univ., School of Education

Ida H. Friday, M.P.H., 111 North St., Chapel Hill, N. C., Director of Health Education Workshop, School of Public Health, Univ. of North Carolina

Gale C. Griswold, M.A., 4791 Powers Ferry Rd., Atlanta, Ga., Chief, Production Division, Communicable Disease Center, U. S. Public Health Service

Grant Hess, 321 Baird Bldg., Boise, Ida., State Commander, Idaho Division, American Cancer Society

Dora A. Hicks, M.A., 145 Star Ave., Nacogdoches, Tex., Coördinator of Health Education, Stephen F. Austin State Teachers College

Eveline E. Kappes, M.A., 918 Bagby, Waco, Tex., Asst. Professor of Health and Physical Education, Baylor Univ.

Peter V. Karpovich, M.D., Springfield College, Springfield, Mass., Director of Health Education

Lyn Keyes, M.A., State Office Bldg., Atlanta, Ga., Public Health Educator, State Dept. of Public Health

Marcia Lane, M.P.H., Woodland Road, Westfield, Mass., Health Educator

Allan J. McGuire, R.N., 249 B. Portock Rd., Honolulu, T. H., Chairman, Health Education Committee, Oahu Health Council

Felix A. Montes, M.A., 608 Park Bldg., Portland, Ore., State Representative, National Foundation for Infantile Paralysis, Inc.

Roy W. Morrison, Ph.D., Box 431, Chapel Hill, N. C., Professor of Education, Univ. of North Carolina

Helen R. Mutz, 2233 Gaylord, Denver, Colo., Administrative Asst. to Health Officer, Denver Public Health Dept.

Robert C. Page, M.D., 30 Rockefeller Plaza, New York 20, N. Y., General Medical Director, Standard Oil Company of New Jersey

Emily G. Perkins, Box 147, Eastland, Tex., State Field Army Commander, American Cancer Society

Dr. Edward Cattete Pinheiro, Travessa Ruy Barboza 341, Belem, Para, Brazil, S. A., Head, Health Education Section, Amazon Program of the Servico Especial de Saude Publica

H. Wade Spalding, 8407 California Ave., Seattle, Wash., State Representative, National Foundation for Infantile Paralysis, Inc.

Mabel L. Toran, 1603-35th St., Galveston, Tex., Teacher

#### *Public Health Nursing Section*

Ada E. Anno, R.N., 711 K, Bakersfield, Calif., Public Health Nurse, Kern County Health Dept.

Kathleen W. Brown, R.N., 1044 W. 24th St., Norfolk, Va., Head Nurse, Hampton Roads Medical Center, U. S. Public Health Service

Ruth Collier, 1821 E. 29th St., Baltimore 18, Md., Administrative Supervisor, Southeastern Health District, City Health Dept.  
Myrtle L. Cooper, R.N., 620 Magnolia St., Monticello, Fla., Public Health Nurse, Jefferson County Health Unit

Alice K. deBenneville, 519 Smithfield St., Pittsburgh, Pa., Exec. Director, Public Health Nursing Assn. of Pittsburgh

Ivy E. Dolby, City Hall, Room 101, Camden, N. J., Exec. Secy., Camden County Tuberculosis Assn.

Sara E. Fetter, R.N., Terrace Dale and York Road, Towson 4, Md., Public Health Nursing Consultant in Maternity, State Dept. of Health

Erika N. Hofrichter, Washington Depot, Connecticut, Public Health Nurse, Washington Visiting Nurse Assn.

M. Dolores Howley, R.N., U. S. Public Health Service Cancer Control Division, Bethesda, Md., Public Health Nurse

E. Myrl Jensen, R.N., 427 Garfield, Fort Collins, Colo., Public Health Nurse, Larimer County Public Health Nursing Service

Gertrude D. Pieper, R.N., 1230 Amsterdam Ave., New York 27, N. Y., Student, Teachers College, Columbia Univ.

Anne Rice, R.N., 503 W. 121st St., New York 27, N. Y., Student, Teachers College, Columbia Univ.

Bessie P. Williams, 6850 Manor, Dearborn, Mich., Supervisor, Dearborn Dept. of Health

#### *Epidemiology Section*

Joseph F. Sadusk, Jr., M.D., Prudential Insurance Co. of America, Newark, N. J., Assoc. Medical Director

Arthur T. Shima, M.D., 1153 E. 54th St., Chicago 15, Ill., Instructor, Dept. of Anatomy, Loyola University, School of Medicine

David Strong, M.A., 4600 45th St., N. W., Washington 16, D. C., Public Health Representative, U. S. Public Health Service

#### *School Health Section*

Lucile R. Jones, R.N., 939 N. Walnut, Colorado Springs Colo., School Health Supervisor, School District 11

George T. Stafford, Ed.D., 710 Michigan Ave., Urbana, Ill., Health Coördinator, Univ. of Illinois

Elmon L. Vernier, Ed.D., 3 E. 25th St., Baltimore 18, Md., Director of Health and Physical Education, Baltimore Public Schools

Howard A. Wescott, 108 Union St., Schenectady, N. Y., Supervisor of Health and Physical Education, Dept. of Education

#### *Dental Health Section*

James H. Allison, D.D.S., 2227 2nd Ave. E., Hibbing, Minn., School Dentist, Independent School District 27

Charles L. Howell, D.D.S., 3402 Ingleside Ave., Baltimore 15, Md., Student, Johns Hopkins School of Hygiene and Public Health

Nathan L. McGill, D.D.S., 615 N. Wolfe St., Baltimore, Md., Student, Johns Hopkins School of Hygiene and Public Health

E. Mae Scott, D.D.S., 408 Roosevelt Way, San Francisco, Calif., Private Practice

Milton G. Walls, D.D.S., 1470 Lowry Medical Arts Bldg., St. Paul, Minn., Chairman, Dental Health Program Committee, State Dental Assn.

William L. Whitelock, D.D.S., 653 Main St., E., Hamilton, Ont., Canada, Director of Dental Services, Health Dept.

#### *Unaffiliated*

Glenn Bennett, D.D.S., 262 W. Grand Ave., Wisconsin Rapids, Wis., Dentist

George P. Elmstrom, 336 Milford St., Glendale 3, Calif., Optometry Student, Univ. of Southern California

Leonard E. Field, M.D., 130 E. 67th St., New York 21, N. Y., Physician, Internal

Medicine and Cardiology, Mt. Sinai Hospital

William P. Forrest, 6306 Empire State Bldg., WHO, New York, N. Y., Asst. Director, Headquarters Office, World Health Organization

James A. Hamilton, M.A., 520 Essex St., S. E., Minneapolis 14, Minn., Director and Professor, Hospital Administration, School of Public Health, Univ. of Minnesota

A. Lincoln Konwiser, 521 W. 23rd St., New York 11, N. Y., Director of Laboratory, C. F. Kirk Company (Pharmaceuticals)

Margaret K. Lumpkin, M.A., Grace-New Haven Hospital Social Service Dept., New Haven, Conn., Medical Social Worker, Joint Project, U. S. Public Health Service Venereal Disease Division, and Dept. of Public Health, Yale Univ.

Edward S. Murray, M.D., 695 Huntington Ave., Boston 15, Mass., Asst. Professor of Public Health Bacteriology, Harvard School of Public Health

Dr. Herval Oliveira. Servico Especial de Saude Publica, Caixa Postal 621, Belem, Para, Brazil. S. A., County Health Officer

Julian W. Pollard, Ph.D., 77 P St., N. E., Washington, D. C., Food Dept. Exec., Chain Drug Store Organization

Mauricio Rapaport, M.D., Tucuman 1694, Buenos Aires, Argentina, S. A., Pathologist, Ministry of Public Health

Francis X. Walsh, M.D., 333 Geneva Ave., Dorchester 22, Mass., Medical Inspector, Boston Health Dept.

#### EARLY 1947 JOURNALS WANTED

The Circulation Department would appreciate receiving a few copies of the January, February, April, and June JOURNALS to furnish to members and subscribers who sent in their renewals after the supply of these issues became depleted. Individual members or organizations who can spare one or more of these issues are requested to mail them to the A.P.H.A. Office, 1790 Broadway, New York 19, N. Y., collect.

## ACCREDITATION OF TULANE UNIVERSITY

Tulane University School of Medicine, Department of Public Health, has been accredited for the academic year 1947-1948 to give the Master of Public Health degree. On October 6, the Committee on Professional Education voted to recommend to the Executive Board the accreditation of Tulane University. Accreditation was granted by the Execu-

tive Board on October 8, 1947. This brings the number of institutions accredited to give the Master of Public Health (M.P.H.) degree, (Diploma of Public Health—D.P.H.—in Canada) to a total of eleven. Of these institutions seven have been accredited for 1947-1948 to give the Doctor of Public Health (Dr.P.H.) degree.

Institutions Accredited by the American Public Health Association  
To Give the Degree of Master of Public Health (Diploma of Public  
Health in Canada) and Doctor of Public Health for the  
Academic Year 1947-1948

CALIFORNIA, UNIVERSITY OF  
School of Public Health  
Berkeley 4, Calif.

M.P.H., Dr.P.H.

COLUMBIA UNIVERSITY  
School of Public Health  
New York 32, N. Y.

M.P.H., Dr.P.H.

HARVARD UNIVERSITY  
School of Public Health  
Boston 15, Mass.

M.P.H., Dr.P.H.

JOHNS HOPKINS UNIVERSITY  
School of Hygiene and Public Health  
Baltimore 5, Md.

M.P.H., Dr.P.H.

MICHIGAN, UNIVERSITY OF  
School of Public Health  
Ann Arbor, Mich.

M.P.H., Dr.P.H.

MINNESOTA, UNIVERSITY OF  
School of Public Health  
Minneapolis 14, Minn.

M.P.H.

NORTH CAROLINA, UNIVERSITY OF  
School of Public Health  
Chapel Hill, N. C.

M.P.H., Dr.P.H.

TORONTO, UNIVERSITY OF  
School of Hygiene  
Toronto 5, Ontario, Canada

D.P.H.

TULANE UNIVERSITY  
School of Medicine  
Department of Public Health  
New Orleans 13, La.

M.P.H.

VANDERBILT UNIVERSITY  
School of Medicine  
Nashville 4, Tenn.

M.P.H.

YALE UNIVERSITY  
School of Medicine  
Department of Public Health  
New Haven, Conn.

M.P.H., Dr.P.H.

## EMPLOYMENT SERVICE

The following pages present information for those seeking qualified public health personnel and for those seeking positions in public health.

This is a service of the Association conducted without expense to the employer or employee.

Address all correspondence to the Employment Service, A.P.H.A., 1790 Broadway, New York 19, N. Y., unless otherwise specified.

### POSITIONS AVAILABLE

(Supplemental to list in November Journal)

**Health Officer**, well qualified for McLean County Health Department, Illinois. Population 73,930 including city of Bloomington (32,900), which is the county seat and health department headquarters. Health department was established in 1945 and at present has a staff of 17 with all positions filled. Starting Salary \$7,200-\$8,100, depending upon training and experience. Write to R. P. Peairs, M.D., President, County Board of Health, 123 North Street, Normal, Ill.

**Sanitary Engineer** with sanitary engineering degree and two years' experience in environmental sanitation, or Assistant Sanitary Engineer requiring degree but no experience. Write to Civil Service Board, 412 City Hall, Dallas, Tex.

**Bacteriologist** to be in charge of city public health laboratory. Man preferred. Salary depends upon experience. Apply to Civil Service Board, 412 City Hall, Dallas, Tex.

**Pediatrician** with special experience in heart disease by the Territorial Department of Health. Beginning salary \$600 per month. Write C. Earl Albrecht, M.D., Commissioner of Health, Juneau, Alaska.

Well qualified **Bacteriologist and Serologist** to act as Assistant to Director of State Laboratory; Four years' experience in bacteriology including one year's experience in administrative capacity; college graduate, supplemented by graduate work in science leading to a master's degree in bacteriology or public health; salary \$3,840 to \$4,800; Civil Service status; retirement; permanent. Apply to: Mr. A. T. Johnson, Personnel Officer, Oregon State Board of Health, 1022 S. W. 11th Avenue, Portland 5, Ore.

**Six Health Officers** at once. Preferably under 45. Will employ two young medical doctors without public health training or experience at salary of \$6,000 plus mileage at  $7\frac{1}{2}\text{¢}$ . Will place on payroll and give some orientation before assigning to counties as local health officers. Also, two Physicians with some public health

training and experience at beginning salary of \$6,300 or \$6,600 for well organized health units. Also, need two well trained and experienced men for larger health units at salaries from \$6,600 to \$8,400. Applicants must be eligible for licensure by Florida Medical Board. Headquarters of these health units are at Lake City, Monticello, Quincy, Bartow, West Palm Beach, and St. Petersburg, Fla. Write or wire Wilson T. Sowder, M.D., State Health Officer, Florida State Board of Health, P. O. Box 210, Jacksonville, Fla.

**Sanitarian** for modern food handling and restaurant sanitation program. Beginning salary \$3,120, annual increments. Car furnished. Position provides for vacation, sick leave, retirement benefits, permanency. For further particulars write Charles A. Neafie, M.D., Director, Department of Public Health, Pontiac 15, Mich.

**Veterinarian** for modern (quality) milk control program. Beginning salary \$3,120, annual increments. Car furnished. Position provides for vacation, sick leave, retirement benefits, permanency. For further particulars write Charles A. Neafie, M.D., Director, Department of Public Health, Pontiac 15, Mich.

1. **Public Health Nurse**, either with public health training or sufficient experience, for Taylor County, Florida. Salary range is prescribed by the Merit System from \$175 to \$250, depending upon training and experience. Must own car; mileage of  $7\frac{1}{2}\text{¢}$  per mile allowed. State retirement, state compensation, annual sick leave and annual vacation.

2. **Supervising Nurse** for Taylor and Madison Counties. Salary range from \$200 to \$275 per month. Communicate with Robert F. Savre, M.D., Director, Madison County Health Department, P. O. Box 187, Madison, Fla.

**Public Health Nurses** for generalized program. Salary range \$1,680 to \$2,820 a year, based on qualifications. Under Merit System, retirement system, vacation and sick leave. Mileage paid at  $6\frac{1}{2}\text{¢}$

per mile. Apply to Dr. Fred G. Pegg, Health Officer, City-County Health Department, Winston-Salem, N. C.

**Public Health Laboratory Technician** for County Health Department. Must have valid state Public Health Laboratory Technician's certificate or be eligible to apply for same. Salary is \$240 a month. Position is permanent and carries County civil service status. Write Civil Service and Personnel Office, Courthouse, San Bernardino, Calif.

**Veterinarian.** Licensed in Ohio or eligible for reciprocity, to assume, Chief, Division of Dairy & Foods. Meat and fowl inspection, slaughter house sanitation; three lay assistants. Active County-City Department of Health. Prefer candidate having public health experience to assist in coordination of general health education program. Salary open pending qualifications. Write Box 0-3. Employment Service. American Public Health Association.

**Executive Secretary** for Industrial Health Education Program in midwestern metropolitan city. Duties are to promote to industry and organized labor groups a coordinated health education program, on behalf of the official and voluntary agencies in the community and to edit monthly health education bulletin to workers. Project under direction of a management body composed of representatives of industry, organized labor, and the health agencies. Graduation from an accredited college or university, including training and experience in health education, community organization, promotion and editorial skill essential. Salary \$4,000-\$5,000. Write Box M-2 Employment Service A.P.H.A.

**Associate Bacteriologists:** Applicant must have a college degree and one year of training in a State Public Health Laboratory or a School of Public Health and Hygiene. Salary: \$2,832-\$3,638. Apply State Department of Health, Box 1877, Richmond, Va.

**Assistant Bacteriologist** for City of Kalamazoo, Mich. To perform bacteriological and serological examinations. College degree with emphasis on science and one year pertinent experience or equivalent combination of training and experience required. Write. Personnel Office, 241 W. South Street, Kalamazoo 9, Mich. Application will be received until further notice.

**Public Health Nurse** as Assistant Director in children's Health School. Full responsibility for home investigation and

admissions. Coöperative responsibility with Director for administration of institution. Good salary plus full maintenance. Health Hill, 2801 East Boulevard, Cleveland, Ohio.

**Public School Nurse** for city in Michigan. Year round position with one month's vacation with pay in the summer. Write Box H-3. Employment Service. A.P.H.A.

**Health Officer** for the Effingham-Shelby Bi-County Health Department in central Illinois. Combined population 50,000. Department established by referendum in 1946. Staff of 12 planned. Salary \$7,200 plus travel. Write to O. G. Kauder, M.D., Findlay, Illinois, or Mr. J. H. Griffin, Teutopolis, Ill.

**Industrial Hygiene Engineer or Sanitary Engineer** with Industrial Hygiene Specialty for Arizona Department of Health. Will train qualified person. Merit System position with vacation and sick leave. \$325-385 with travel allowance. Write Division of Sanitary Engineering, Capital Building, Arizona, State Department of Health, Phoenix, Ariz.

**Staff Public Health Nurse** in the Department of Public Health, Oak Ridge, Tenn. Generalized Nursing Service for city of 35,000 population. Industry in connection with the research and development of nuclear power. Minimum salary \$2,709 per annum. Forty hour work week. Car furnished for all official work. Apply: Charles H. Benning, M.D., M.P.H., Director of Public Health, P. O. Box 486, Oak Ridge, Tenn.

**Physician** as Director City-County Health Department, Eau Claire, Wis., population 56,000; staff of 14; ideal offices and laboratory. Salary for man with degree in public health \$6,420 plus 6¢ per mile travel. Write City-County Health Department, Safety Building, Eau Claire, Wis.

**Graduate Nurse** preferably with Master's degree to direct Central Service for the Chronically Ill, a unit of the Regional Health and Welfare Council. With guidance of a Steering Committee, the administrator plans and directs the work of the Committees engaged in the promotion and development of facilities for better care of chronically ill persons. Supervisory or administrative experience in public health and institutional nursing desirable. Apply to: Health Division, Health and Welfare Council Inc., 311 So. Juniper Street, Philadelphia 7, Pa.



**Assistant Health Officer** with M.D. degree. Must have had administrative experience. Full-time position. Beginning salary \$5,640 annually. Apply Health Officer, Court House, Riverside, Calif.

**Assistant Pediatrician.** Full-time position, with state license or eligible for such license. Special training or experience in Maternal and Child Health. Actual travel expenses allowed. Riverside County, California. Apply Health Officer, Court House, Riverside, Calif.

**Public Health Engineer.** Full-time position, with training and experience to head Division Environmental Sanitation. Salary \$4,500 annually, with actual travel expenses. Apply Health Officer, Court House, Riverside, Calif.

**Medical Officer.** Monthly salary range from \$460 to \$580 in five annual steps of \$30. Allowance for meals and travel expense. Merit system with an attractive retirement plan. California license to practise medicine necessary. Inquiries should be addressed to Dr. William C. Buss, Kern County Health Officer, Post Office Box 120, Bakersfield, Calif.

**Assistant Professor of Bacteriology** with Ph.D. degree or near to it; areas of interest should be medical bacteriology, immunology, and taxonomy. Should have keen interest and ability in research. Will teach general bacteriology and taxonomy for the next two years, and then assume full charge of work in medical bacteriology and taxonomy. Position available now. Write Box P-2. Employment Service. A.P.H.A.

**Virologist or Bacteriologist, Ph.D.** Production and developmental research in Virus Department of a large Eastern pharmaceutical and biological house. Position carries considerable responsibility. Salary commensurate with training and experience. Replies held in confidence. Write Box R-2. Employment Service. A.P.H.A.

**Supervisory Staff Nurse.** Certificate in public health nursing. Salary \$2,460-\$2,700 payable monthly. 40-42 hour week, two weeks annual leave, 2 weeks sick leave.

**Two Staff Nurses,** postgraduate work in public health nursing or acceptable public health experience. Salary \$2,220-\$2,400 payable monthly. Own automobile required, annual travel allowance of \$540. Write Box Q-2. Employment Service. A.P.H.A.

**Dentist** to operate mobile dental unit doing children's dentistry. Salary \$4,500 plus \$7.20 per week cost of living increase, and travel expenses. Write Division of Dental Health, State House, Augusta, Me.

**Dentists** for children's operative clinics in the Cincinnati, Ohio Schools. Full-time or half-time, 5 days per week. Minimum annual salary full-time \$3,300. Vacation with pay. Sick leave and retirement. License to practise in the State of Ohio schools. Minimum annual salary full-time \$2,100 5 days per week. Vacation and sick leave with pay and retirement. If interested, contact Dr. E. H. Jones, 530 Provident Bank Building, Cincinnati 2, Ohio.

**Staff Veterinarian** to work in meat, milk, and food in the City of Flint, Mich., Health Department. Salary range \$3,394 to \$3,769. Write to Civil Service Commission, City Hall, Flint, Mich.

**Health Commissioner** for County of 40,000, Midwest. Possibility of including three cities located in the county in the County Unit. Salary \$6,600 plus traveling expenses. Write Box K-2. Employment Service. A.P.H.A.

**Dental Hygienist** to examine school children and conduct health education programs in the Cincinnati, Ohio schools. Minimum annual salary full-time \$2,100 5 days per week. Vacation and sick leave with pay and retirement. If interested, contact Dr. E. H. Jones, 530 Provident Bank Building, Cincinnati 2, Ohio.

**Public Health Nurses,** qualified for resort area of Northern Michigan. Positions open immediately for staff and senior nurses. Salaries \$2,400 and \$2,700 respectively. Liberal car allowance. Excellent region for those with hay fever. Write for personnel form to Northern Peninsula Office, Michigan Department of Health, Escanaba, Mich.

**Assistant Director** in Division of Laboratories to be in charge of branch laboratory. Master's degree plus 4 years' experience in public health laboratory; or 3 years of experience and one year of study in approved school of public health. Salary \$325-\$400 monthly. Write Box S-2. Employment Service. A.P.H.A.

**Supervising Nurse** with degree, experienced, for County Health Department with a staff of ten nurses. Salary \$3,120 plus mileage. Write Box T-3. Employment Service. A.P.H.A.

**Public Health Nurses** (Staff Nurses, Supervisors, Educational Directors, Consultants, Directors). Many interesting positions with good salaries available in voluntary and official agencies in various sections of the country, both urban and rural. At least minimum N.O.P.H.N.

qualifications required for most positions in the different grades. No fees of any kind. To register for placement visit or write to the Nurse Counseling and Placement Office, New York State Employment Service, 119 West 57th Street, New York 19, N. Y.

### Apprentice Training Program for Public Health Nutritionist in New York State

The New York State Health Department announces a new program for the training of public health nutritionists. The objective is "to offer experience under close supervision in the public health field to nutritionists with good academic training but inadequate field experience."

A.B.S. degree from a recognized institution with sound training in human nutrition and one year of graduate work leading to a master's degree represents the basic academic requirement. In addition, it is desirable that workers in public health nutrition have special courses in public health education, community organization and resources, child development, and the making of dietary studies.

It is planned to offer a 12 month period of supervised field service on an annual stipend of \$2,500 plus travel allowance. Car desirable but not essential. Write to Senior Nutritionist, Division of Maternal and Child Health, New York State Department of Health, 39 Columbia Street, Albany 7, N. Y.

### POSITIONS WANTED

**Non-medical administrator**, male, age 33, trained and experienced in community organization, program development, rehabilitation, publicity, public relations; at present employed in large state welfare planning and action organization. Interested in position as executive secretary or in related function in voluntary or official health agency. Write Box A-529. Employment Service. A.P.H.A.

**Staff Public Health Nurse** for generalized program at the Mamaroneck Health Center, Inc. Salary \$2,580 per year. Thirty-eight hour work week—car furnished. Apply to Mrs. Genevieve Heatley, President, Mamaroneck Health Center, Inc., 234 Stanley Avenue, Mamaroneck, N. Y.

**Dental Hygienists** for Child Health Programs. Beginning Salaries \$2,168.28-\$2,394. Write to: U. S. Public Health Service, Dental Public Health Section, Washington 11, D. C.

**Tuberculosis Clinician.** Duties include organizing and supervising tuberculosis diagnostic clinics throughout the state, organizing community and industrial x-ray surveys, interpreting x-ray films, and assisting with other related tuberculosis control activities. Must be elig-

ible for West Virginia license. Salary range, \$420 to \$500 monthly, plus travel. Address inquiries to West Virginia State Dept. of Health, Charleston, W. Va.

**Supervisor of Health Education Department** needed in Chicago and Cook County Tuberculosis Institute, man preferred. Candidates must have public health background and experience in community education programs. Salary open. Excellent opportunity for developing broad education in tuberculosis control programs. For further information write Dr. E. E. Kleinschmidt, Tuberculosis Institute of Chicago and Cook County, 343 South Dearborn Street, Chicago 4, Ill.

### GOVERNMENT OF THE DISTRICT OF COLUMBIA, WASHINGTON, D. C.

**Graduate nurses** for staff duty in Glenn Dale Tuberculosis Sanatorium located 15 miles from the Nation's Capitol. Salary \$2,644.80 per annum. Apply Director of Nursing, Glenn Dale Sanatorium, Glenn Dale, Md.

**Negro Woman Health Education Worker.** Capable of executing an extensive health education program. B.A. degree, 12 years' experience as social worker. 3 years as Health Education

Secretary for County Association. Special training in field of Tuberculosis control. Write Box H-542. Employment Service. A.P.H.A.

Woman Biologist, M.A., D.Sc., several years' experience in morphology, experimental pathology, interested either academic position or industrial research. Write Box L-541. Employment Service. A.P.H.A.

Health Educator, female, experienced in promotion and organization of community activities. Prepared to handle complete details of new program to formulate policies, train personnel, act as liaison between community agencies. B.S. degree in Health Education. Present employment with voluntary health agency. Minimum salary \$4,000. Write Box H-540. Employment Service. A.P.H.A.

Sanitarian with more than six years' experience in various phases of environmental sanitation inclusive food, water, and insect control desires position. Holds Canadian Public Health Association certificate as Sanitary Inspector. Write Box E-522. Employment Service. A.P.H.A.

Sanitary Engineer B.S. 12 years' experience in public health engineering with State and Federal Agencies and Army. Some graduate work; currently on terminal leave; desires position in official agency or private industry; free to travel. Write Box E-520. Employment Service. A.P.H.A.

Milk and Food Specialist. Young man with eight years of experience in milk and food sanitation and its allied fields, last five years with U. S. Public Health Service, Master's degree. Desires position as director of division or comparable industrial position. Write Box M-438. Employment Service. A.P.H.A.

Physician, woman, 34 years old, M.P.H. 1947 (Harvard), graduate of recognized Central European Medical School, U. S. citizen. Approved internship, residencies in surgery, obstetrics, medicine (including geriatrics). Clinical teaching experience in obstetrics. 2 years' private practice. Interested in openings in maternal and child health, school health, or general administrative work with official or voluntary agency. Write Box C-419. Employment Service. A.P.H.A.

Health Educator, woman, Negro, M.A. in Health Education (University of Michigan); 14 years' teaching experience in schools as well as community health education; last two years Executive Secretary of national agency engaged in promotion of volunteer health programs. Writing and editorial experience. Write Box H-544. Employment Service. A.P.H.A.

Bacteriologist, M.P.H., University of Michigan. Woman, 28. Now employed. Background in bacteriology and chemistry of milk and water and in bacteriology and epidemiology of communicable diseases. Some academic work in administration. Research experience in industrial wastes. Four years' practical experience in a State Board of Health Laboratory. Write Box L-545. Employment Service. A.P.H.A.

Parasitologist, B.S. (major in biology), graduate work (27 credits) in parasitology and protozoology. Male, 28 years, married, 6 years' laboratory experience in parasitology and serology. Experience includes work in armed forces, university research laboratory, industrial research laboratory. Write Box L-547. Employment Service. A.P.H.A.

Bacteriologist with a M.S.P.H. and a Ph.D., minor in chemistry; over 9 years' experience in all phases of diagnostic bacteriology and serology in a State Health Laboratory, with specialization in the serology of syphilis and other diseases; some teaching and considerable research experience. Seeking a position in the East with research opportunities, in industry, public health, or educational institution. Write Box L-549. Employment Service. A.P.H.A.

Chemist, Virologist, B.A., experience in research on pathogenic viruses (Army Bacteriological Warfare Project), as well as in micro-spectrophotometric vitamin analyses in nutrition survey. Male, single, will travel. Write Box L-543. Employment Service. A.P.H.A.

Nutritionist, Home Economist, female, 28 years, M.A., 8 years' hospital and community experience; teaching experience. Member A.D.A. and A.H.E.A. New York preferred but will travel. Write Box N-417. Employment Service. A.P.H.A.

*Advertisement***Opportunities Available**

**WANTED**—(a) Public health nurse executive to direct infant welfare agency; extensive experience prenatal, infant welfare and pediatrics required; must have ability to direct large staff of public health nurses; \$6,000. (b) Outpatient supervisor; teaching clinic averaging 100,000 visits annually affiliated with medical school and hospital; \$3,000–\$5,000; East. (c) Public health nurse of supervisory caliber with knowledge of Spanish to supervise modern health center in Latin America. (d) Supervising public health nurses; Southern California. (e) Student health nurse; young women's college; Pacific Coast. (f) Public health supervising and staff nurses; generalized services; expansion program; opportunity for obtaining interesting experience; salaries depend upon qualifications; for staff nurses, \$3,500–\$3,600; nominal living expenses; West. **PH12-1** Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago 11.

**WANTED**—(a) Medical director; health service of national organization; administrative experience required; would be assigned responsibility of health service for organization in seven of southeastern cities. (b) Director of student health; college for young men having enrollment of 800; town of 100,000; apartment available on campus; East. (c) Director of newly-established public health department covering five counties; preferably one qualified to organize department; staff will consist of sanitarians, inspectors, public health nurses, technicians; \$8,000; travel allowance; Southwest. (d) Medical officer; key position requiring administrative ability; \$7,200; Latin America.

**PH12-2** Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago 11.

**WANTED**—(a) Health educator experienced in tuberculosis work to organize new program in connection with state tuberculosis association; master's degree required; East. (b) Director of new agency organized to care for chronically ill; graduate training in social work or public health; several years' supervisory experience required; \$4,000–\$5,000. (c) Health educator to serve as executive secretary council on health education now being established; middle western city considered important medical center. (d) Health educator; city health department, university medical center, Middle West; around \$4,000. **PH12-3** Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago 11.

**WANTED**—(a) Sanitary engineer; faculty appointment; extensive experience in water treatment work required; must have ability to conduct research; middle western university. (b) Sanitary and industrial engineer; public health program planning expansion; West. (c) Sanitary engineer; duties consist of teaching sanitary engineering and health education; Master's degree required; university medical school; West. (d) Sanitary engineer with public health background; should be experienced with water and malarial control, insect control, etc., would direct department in tropical country of 7,000,000. **PH12-4** Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago 11.

*Advertisement***Opportunities Wanted**

Public health director; Ph.B., C.P.H., M.D. degrees; four years' experience as county health officer; three years' industrial experience (wartime assignment); now director of metropolitan department of health; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Sanitarian; B.S. degree in Civil Engineering; six years, maintenance engineer with large institution; seven years, sanitary engineer where assignments have included insect control, general environmental sanitation; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Health educator; B.S., M.A. degrees, eastern universities; several years, director of physical education in public schools; four years, health educator, nationally-known organization; three years, health educator in industry; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Public health nurse is available for administrative appointment; Master's degree in Public Health; eight years, industrial nursing consultant to public health agency; past several years, in charge of generalized state-wide program; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

## NEWS FROM THE FIELD

### DR. MUSTARD BECOMES NEW YORK CITY COMMISSIONER OF HEALTH

Harry Stoll Mustard, M.D., on November 3 was appointed Commissioner of Health of the City of New York by the Mayor, the Honorable William O'Dwyer. He succeeds Israel Weinstein, M.D., Commissioner since May 24, 1946, who resigned for personal reasons.

Since 1940, Dr. Mustard has been Director of the Columbia University School of Public Health, New York, from which he is taking an indefinite leave of absence to fill the new position. He is retiring President of the American Public Health Association, having also edited the JOURNAL between 1941 and 1944.

Dr. Mustard's experience in public health, going back to 1920, is a varied one. After teaching in his alma mater, the Medical College of South Carolina, he served successively as scientific assistant in the U. S. Public Health Service, Preston County (W. Va.) Health Officer, Director of the Commonwealth Fund's Child Health Demonstration in Rutherford County (Tenn.), Associate Professor of Public Health in The Johns Hopkins School of Hygiene and Public Health, Hermann M. Biggs Professor of Preventive Medicine at New York University College of Medicine and, since 1940, as Professor of Public Health Practice and Director of Columbia University School of Public Health.

During the summer of 1947, Dr. Mustard was a representative of the Association at the meeting of the Royal Sanitary Institute in Torquay, England. During the recent 75th Annual Meeting of the Association in Atlantic City, he was one of three members of the Association to be presented with Honor-

ary Fellowship in the British Society of Medical Officers of Health.

Dr. Mustard is the author of *Cross Sections of Rural Health Progress*, 1930; *An Introduction to Public Health*, 1935, 2nd ed., 1944; *Rural Health Practice*, 1936; and *Government in Public Health*, 1945.

### NATIONAL TUBERCULOSIS ASSOCIATION TO HAVE NEW MANAGING DIRECTOR

The resignation of Kendall Emerson, M.D., as Managing Director of the National Tuberculosis Association after nearly twenty years with the organization was announced on September 30, the resignation to become effective January 1, 1948.

Dr. Emerson was appointed to his present post in 1928, coming from the practice of orthopedic surgery in Worcester, Mass., and after an extended military and Red Cross experience in World War I. Twenty Years ago the N.T.A. had about 1,750 affiliated associations. Under Dr. Emerson's leadership the tuberculosis control movement has grown until there are now 3,000 associations in affiliation with the N.T.A., located in every state, the District of Columbia, Puerto Rico, Hawaii, Alaska, and the Canal Zone. The services of the Association during the same period were broadened to include rehabilitation, industrial and adult health education programs. At the same time increasing emphasis was placed on medical research with the result that a separate division on medical research was created in 1947 and grants have been made to 18 investigators for the current fiscal year. Dr. Emerson has been a consultant to the U. S. Public Health Service, a counselor of the Medical Council of the Veterans' Admin-

istration, and a trustee of Smith College. From 1931 to 1935 he served as Executive Secretary of the American Public Health Association. At the 1947 meeting of the N.T.A. he was awarded the Trudeau Medal annually presented by the Association for notable accomplishments in the tuberculosis field. After his retirement Dr. Emerson expects to make his home in Norwalk, Conn.

The appointment of James E. Perkins, M.D., Dr.P.H., Deputy Commissioner of the New York State Department of Health, Albany, to succeed Dr. Emerson as Managing Director of the N.T.A. was announced on October 3. A native of Minnesota, Dr. Perkins was graduated in medicine from the State University in 1930, receiving the Doctor of Public Health degree in 1933 from Johns Hopkins School of Hygiene and Public Health where he made tuberculosis his special focus of interest. Dr. Perkins has served the New York State Department of Health as epidemiologist, as district health officer, and director of the Division of Communicable Disease, and finally as Deputy Commissioner. In 1945 he served for several months in Italy with the Medical Nutrition Mission. Dr. Perkins has served for several years as Secretary of the Epidemiology Section, A.P.H.A., and for six years was Associate Editor of the *American Journal of Public Health*.

#### NEW EDITOR OF SURVEY MIDMONTHLY

Thomas Devine became Executive Editor of *Survey Midmonthly*, national magazine of social work, effective with the October number. He succeeds Bradley Buell who resigned to become Director of Community Surveys, Inc. During the past dozen years, Mr. Devine has directed many local community surveys and was chief of the Civilian War Services Branch of the Office of Civilian Defense in Washington. He is the son of Edward T. Devine, first

Editor of *The Survey*, and distinguished leader of social work's pioneer days.

#### MRS. WICKENDEN FIRST NURSE TO RECEIVE MEDAL FOR MERIT

In a ceremony in Washington, D. C., on September 17, Mrs. Elmira Bears Wickenden of Bronxville, N. Y., was awarded the Medal for Merit by Thomas Parran, M.D., Surgeon General of the U. S. Public Health Service, for the President of the United States.

During the war, Mrs. Wickenden served as Executive Secretary of the National Nursing Council for War Service. The Medal for Merit was given in honor of her outstanding contribution to her country during World War II. The citation said, in part:

Elmira Bears Wickenden, for exceptionally meritorious conduct in the performance of outstanding services to the United States from October, 1941, to December, 1946. Mrs. Wickenden, through her 25 years of experience and background in the field of nursing, pointed out to the Nation the need for a unified nursing profession in the effective prosecution of the war. Her superior organizing talent and energetic action led to the establishment of the Nursing Council on National Defense, which later became the National Nursing Council for War Service.

Mrs. Wickenden is the first nurse and third woman in the history of the United States to be awarded the Medal for Merit by the President of the United States.

#### COLORADO STATE LABORATORY EXPANDS SERVICES

The Central Laboratory of the Colorado Department of Public Health, in order to fill numerous requests of physicians will add total protein in spinal fluids, new rapid culture for tubercle bacilli, typing of organisms of the enteric group, mycology and laboratory evaluation to its services. All licensed physicians in the state may avail themselves of these services.

#### APPOINTMENTS IN VIRGIN ISLANDS DEPARTMENT OF HEALTH

Dr. Kund Knud-Hansen has retired as Commissioner of Health after many years of government service. The Acting Commissioner is Dr. John S. Moorhead, a native of St. Croix. After seven years of service, Dr. Norman D. Thetford, St. Croix, has taken a terminal leave from the post of Assistant Commissioner of Health and Chief Municipal Physician. Dr. Roy A. Anduze, a native of St. Thomas, will succeed him on a temporary basis.

The Virgin Islands Department of Health operates general hospitals and clinics and performs the usual functions of a state health department. The two top positions, commissioner of health and chief municipal physician for St. Thomas and assistant commissioner of health and chief municipal physician for St. Croix, are both federal posts in the U. S. Department of Interior.

#### INTERNATIONAL UNION AGAINST THE VENEREAL DISEASES

The first post-war General Assembly of the International Union against the Venereal Diseases was held in Paris, October 20 to 25. The program of the Assembly was developed under four main heads:

1. Collaboration with the medical profession
2. Treatment of syphilis by penicillin
3. The social campaign against venereal diseases
4. Sexual conduct and the venereal diseases

The post-war program objective of the Union is the establishment of world-wide service through a series of regional offices. The first to be set up is the Regional Office for the Americas, operated for the Union by the American Social Hygiene Association at its headquarters at 1790 Broadway, New York.

William F. Snow, M.D., is the President of the International Union. Other

members of the United States delegation at the recent General Assembly were:

James A. Doull, M.D., Chief of the U. S. Public Health Service, Office of International Health Relations  
J. R. Heller, Jr., M.D., Chief, U. S. Public Health Service, Venereal Diseases Division  
Miss Jean B. Pinney, Director of the Union's Regional Office for the Americas at 1790 Broadway, New York

The Secretary-General of the Union is Dr. Andre Cavailon of France.

#### AMERICAN RED CROSS NATIONAL BLOOD PROGRAM

After several months of intensive study and consideration with medical and health leaders, the American Red Cross has adopted a National Blood Program. Its purpose is to provide for medical use, without charge for the products, sufficient blood and blood derivatives throughout the nation to help save lives and prevent needless suffering.

The phases of the program for supplying blood and blood products for medical use are:

1. Collecting blood
2. Processing it for use as whole blood and blood derivatives, including packing and storage
3. Distribution of both the blood and the blood products for use by physicians and hospitals for any patient needing them
4. Continuous research and investigation of the quality of the products, their safety, and important uses

The announcement of the program indicates that it will be one of gradual development with not more than 20 or 25 carefully selected centers set up in the first year. It is estimated that it may take from three to five years for the program to reach full operation.

#### NEW MEMBERS OF THE FEDERAL HOSPITAL COUNCIL

Announcement has been made of the appointment of the following new members to the Federal Hospital Council

established last year to assist Surgeon General Thomas Parran of the U. S. Public Health Service in the administration of the hospital survey and construction program:

Nelson Cruikshank, Director of Social Insurance Activities of the American Federation of Labor

James A. Paullin, M.D., Professor of Clinical Medicine, Emory University and former President of the American Medical Association and the American College of Physicians

Joseph W. Fichter, Master of the Ohio State Grange

#### SEATTLE AND KING COUNTY JOIN HANDS

Early in September, the Seattle, Wash., Health Department assumed responsibility for the administration of the activities formerly carried by the King County Health Department. The merger was effected by a city council committee in coöperation with the county commissioners and is designed to provide better health protection both within the county and city at less cost.

Emil E. Palmquist, M.D., Health Director of the City of Seattle will serve as chief administrative officer of the merged department but final consolidation must await state legislative action.

#### COURSES IN THE LABORATORY DIAGNOSIS OF PARASITIC DISEASES

Three 6 week refresher courses for laboratory personnel in the Laboratory Diagnosis of Parasitic Diseases will be offered during 1948 by the Laboratory Division of the Communicable Disease Center of the U. S. Public Health Service in Atlanta. The dates are: January 12-February 20; July 12-August 20; and October 11-November 19.

This training is open to all grades of employed laboratory personnel and is given primarily for workers in laboratories of state and local public health departments. Applicants from hospitals and private laboratories will also be considered when vacancies occur.

There is no tuition or laboratory fee

but travel and living expenses must be paid for by the individual or his employer. Such expenses can be paid from Title VI funds.

Applications should be made as early as possible. Notification of acceptance will be made approximately two months before the course begins so that states may have time to arrange budgetary allotments.

Laboratory directors and senior staff members may attend these 6 week courses. However, one or two short courses in the Laboratory Diagnosis of Parasitic Diseases will be scheduled for such workers. Definite dates have not been set, but those interested should indicate their first and second choice of the following 1948 dates: March 8-19; May 10-21; and December 6-17.

Address further inquiries to the Laboratory Division, Communicable Disease Center, U. S. Public Health Service, 291 Peachtree Street, Atlanta, Ga.

#### HONORARY FELLOWSHIPS PRESENTED IN BRITISH SOCIETY OF MEDICAL OFFICERS OF HEALTH

Three members of the American Public Health Association were presented honorary fellowships in the British Society of Medical Officers of Health at the 75th Annual Meeting of the A.P.H.A. in Atlantic City, October 7.

Presentations for the British society were made by Sir Allan Daley, Medical Officer of Health of the London County Council, to:

Thomas Parran, M.D., Surgeon General of the U. S. Public Health Service

Harry S. Mustard, M.D., President of the Association and Director of the Columbia University School of Public Health

George K. Strode, M.D., of New York City, Director of the Rockefeller Foundation's International Health Division

Sir Allan declared the Society was citing the three as "eminently distinguished in public health."



Membership of the 90 year old British Society, numbering approximately 2,000, is made up of administrative health officers of local health departments in Britain.

#### MARKLE FOUNDATION'S POST-FELLOWSHIP GRANTS

The John and Mary R. Markle Foundation announces a new program in coöperation with medical schools of the United States and Canada for the purpose of relieving the teacher-investigator shortage in the schools. In the academic years, 1948-1949, it will inaugurate "Post-Fellowships" to aid young scholars in medical science. The program will provide an opportunity for promising scientists to develop as teachers and investigators capable of making important contributions to medical science.

The plan resulted from the Foundation's survey which showed many potential teachers and investigators drawn away from academic medicine when lack of trained investigators limited the use of sums available for fundamental research. The scientists will be known as "Scholars in Medical Science." They will be recommended by the medical schools, and final choice will be made by regional committees of the Foundation. Neither the number of scholars nor the exact amount of the scholarships is fixed but will depend upon existing circumstances.

Persons interested in being considered as candidates for these Post-Fellowships must do so through their own medical schools.

#### FILM ON PECKHAM EXPERIMENT

Expected for release in November, 1947, is a documentary film record of the Peckham Experiment and its Pioneer Health Centre in England. The film has been described as "an epic documentary presentation of social activities." It will be distributed abroad as

well as in England. Requests for booking the film should be directed to the British Embassy in Washington, D. C.

#### ANNUAL DANA MEDAL TO DR. VERHOEFF

At the Faculty Luncheon of the American Academy of Ophthalmology and Otolaryngology in Chicago recently, Frederick H. Verhoeff, M.D., Professor Emeritus of Ophthalmic Research at Harvard Medical School and Consulting Chief of Ophthalmology at the Massachusetts Eye and Ear Infirmary, received the Leslie Dana Gold Medal awarded annually for outstanding achievement in the prevention of blindness and the conservation of vision.

#### GEORGE J. NELBACH RETIRES

On September 1, 1947, George J. Nelbach retired as Executive Secretary of the State Committee on Tuberculosis and Public Health in the New York State Charities Aid Association after 40 years of service. During this period, a network of 62 county and city tuberculosis and health associations was organized in the state. Not only has the state committee been active in the eradication of tuberculosis during these 40 years but it has also taken part in the development of New York State's health legislation as well as in campaigns to reduce diphtheria, control venereal diseases, and organizing adequate community health programs.

Robert W. Osborn, a Staff Assistant since 1924, has been appointed Acting Executive Secretary to succeed Mr. Nelbach.

#### CHLORINE, CHLORAMINE, AND CHLORINE DIOXIDE

The procedure for determining quantitatively the amount of free chlorine, chloramine, chlorine dioxide, and sodium chlorite in water containing a mixture of these constituents was the subject of a paper presented by Dr. John F. Haller

and S. S. Listek before the Water, Sewage and Sanitation Section of the American Chemical Society during their recent Annual Meeting.

The method described consists of four amperometric titrations with sodium arsenite. Free chlorine is determined by titration of a sample from which chlorine dioxide has been removed by hydrolysis at alkaline pH. A second titration, in the presence of iodide, gives the combined concentration of chlorine and chloramine. A third titration, in neutral solution, gives the combined concentration of chlorine, chloramine and one-fifth of the chlorine dioxide. After acid hydrolysis, a fourth titration in neutral solution gives the total oxidizing capacity, thus permitting the calculation of chlorine content.

#### AMERICAN HOSPITAL ASSOCIATION

At the recent meeting of the American Hospital Association in St. Louis, the following officers were elected:

*President:* Edgar C. Hayhow, Director, East Orange (N. J.) General Hospital

*President-Elect:* Jessie Turnbull, Administrator, Elizabeth Steel Magee Hospital, Pittsburgh, Pa.

*First Vice-President:* George U. Wood, Superintendent, Peralta Hospital, Oakland, Calif.

*Second Vice-President:* Ray Amberg, Superintendent, University Hospitals, Minneapolis, Minn.

#### NORTH CAROLINA HOSPITAL PLAN APPROVED

The Raleigh (N.C.) *News and Observer* of July 12 carried a detailed account of the state-wide meeting of the North Carolina Good Health Association in Greensboro the previous day. At this meeting, Surgeon General Thomas Parran announced formal approval of the plan for hospital construction submitted by the North Carolina Medical Care Commission, of which John A. Ferrell, M.D., is Executive Secretary.

Dr. Parran further announced his approval of the state's application to

receive \$3,431,550 for construction of hospitals during the current year.

At the same meeting, Josephus Daniels presented band leader Kay Kyser with a silver tray "on behalf of all the people of North Carolina for his magnificent contribution to the good health program."

By September 15, five state hospital construction plans had been approved by the Surgeon General—those of Mississippi, Indiana, North Carolina, Oklahoma, and Illinois.

#### MCGILL TO GRANT DEGREE IN TROPICAL MEDICINE

The wartime short course in tropical medicine at McGill University Faculty of Medicine, Montreal, has been revised and additional facilities have been provided for study leading to a D.T.M. degree. The course is being conducted by the Department of Health and Social Medicine with the assistance of members of other faculties of the university. The final third of the course is a period of specially arranged supervised training in tropical countries. This includes clinical hospital practice and health unit work. For further information address the Chairman, Department of Health and Social Medicine, 490 Pine Avenue, West Montreal, Canada.

#### DR. ALTLAND APPOINTED ACTING COMMISSIONER, MICHIGAN DEPARTMENT OF HEALTH

John K. Altland, M.D., M.S.P.H., formerly Director of the Bureau of Local Health Services, Michigan Department of Health, has been appointed by Governor Sigler as Acting Commissioner, succeeding William DeKleine, M.D., who had been State Commissioner of Health since 1944.

Dr. Altland, who is a native of Michigan, received his medical degree from the University of Michigan School of Medicine in 1928, and his master's degree from the Michigan School of Public

Health in 1938. He served for several years as Director of county departments of health and for a period of a year and a half with the U. S. Public Health Service, returning to the State Department of Health as Director of Local Health Services in April, 1946.

#### LECTURES TO THE LAITY

The thirteenth series of the New York Academy of Medicine Lectures to the Laity is now in progress. The general title of the 1947-1948 series is "Perspectives in Medicine." Five of the series of seven remain to be given. They are as follows:

December 17, "Food and Civilization," Sir Raphael Cilento

January 22, "On Being Old Too Young," Edward J. Stieglitz, M.D.

February 4, "Perspectives in Cancer Research," Cornelius P. Rhoads, M.D.

February 26, "Psychiatry for Everyday Needs," William C. Menninger, M.D.

March 11, "The Inter-relation of Pure and Applied Science in the Field of Medicine," James B. Conant, Ph.D.

All lectures begin at 8:30 P.M. The general public is admitted without charge and the audience is invited to submit questions at the end of each address.

#### ANTIMALARIAL DRUG SURVEY PUBLISHED

The Office of Technical Services of the U. S. Department of Commerce announces recent publication of a three volume summary of efforts made in this country's wartime quest of superior antimalarial drugs. Coördinated by the Committee on Medical Research, Office of Scientific Research and Development, the investigations described were carried out between 1941 and 1945 by hundreds of universities, pharmaceutical companies, and various governmental and private laboratories under OSRD contracts. Intended to "expedite research for still better antimalarial drugs and to

establish a pattern for systematic chemotherapeutic studies of other infections," the survey was edited by Frederick Y. Wiselogle, Professor of Chemistry at The Johns Hopkins. The set of three bound volumes sells for \$30 and is obtainable from the publisher, J. W. Edwards, Ann Arbor, Mich. The Office of Technical Services has photostat and microfilm copies for sale.

#### FOURTH INTERNATIONAL CONGRESSES ON TROPICAL MEDICINE AND MALARIA

A preliminary announcement of the Fourth International Congresses on Tropical Medicine and Malaria states that the conference will be held in Washington, D. C., during the period May 10-18, 1948. Actually, it will be a joint meeting of the Fourth International Congress on Tropical Medicine and the Fourth International Congress on Malaria. Invitations to participate have been extended to more than sixty governments. The official languages of the Congresses are English, French, and Spanish. Scientific papers should be prepared in one of those languages.

For further information communicate with Dr. William A. Sawyer, Executive Secretary, Fourth International Congresses on Tropical Medicine and Malaria, Department of State, Washington 25, D. C.

#### PERSONALS

##### Central States

ROBERT H. BISHOP, JR., M.D.† has resigned as director of University Hospitals, Cleveland, Ohio, to become director of the newly formed Joint Committee for the Advancement of Medical Education and Research. This committee has been formed to make Cleveland the outstanding medical center in the Middle West. Dr. Bishop served the city of Cleveland

\* Fellow A.P.H.A.

† Member A.P.H.A.

as its first director of the department of tuberculosis and later as health commissioner.

GRAHAM L. DAVIS,<sup>†</sup> Director of the Hospital Division of the W. K. Kellogg Foundation, Battle Creek, Mich., was elected President of the American Hospital Association, Chicago, Ill., at its 49th Annual Convention held in St. Louis, Mo., September 22-25.

#### CHANGES IN INDIANA STATE BOARD OF HEALTH

GEORGE W. BOWMAN, M.D., who has been in charge of Venereal Disease Control Activities for several years, is being loaned to the Indianapolis City Board of Health to help them in venereal disease control and to continue to work at the rapid treatment center in which work he has played an important part in recent years. Dr. Bowman's work at the State Board of Health will be continued by CARL C. KUEHN, M.D.

GEORGE ERGANIAN, is now working on sewage and refuse disposal in the Division of Sanitary Engineering.

ANN ELIZABETH POORMAN, R.N., began her duties as a hospital consultant nurse for the Division of Hospital and Institutional Services in July.

RUBY ROGERS, has been appointed Medical Social Service Consultant. She was formerly consultant in the Division of Services to Crippled Children, State Department of Public Welfare.

FRANK D. WRIGHT, has been assigned to the Northeastern Branch Office at Ft. Wayne as Assistant Sanitary Engineer.

#### Eastern States

MORTON L. LEVIN, M.D., has been appointed Assistant Commissioner for

Medical Administration with the New York State Department. He was formerly Director of Cancer Control. He is President of the Public Health Cancer Association of America and of the Society for the Study of Mass Medicine.

REMA C. FITCH,<sup>†</sup> formerly with the Aluminum Company of America, New York, N. Y., has been appointed Senior Sanitary Engineer of the Arizona State Department of Health.

YOLANDE LYON,<sup>†</sup> was recently appointed Executive Director of the American Diabetes Association, which recently transferred its executive offices from Cincinnati, Ohio, where it has been located since 1940, to Brooklyn, N. Y. The appointment of an executive director is the first step in the association's war-postponed plans for expansion of its program. Miss Lyon was formerly with the Medical Society of the State of New York as field representative, assistant to the public relations director and consultant on program to the Women's Auxiliary of the Society.

LOUISA WILSON, has been appointed public relations director of the Welfare Council of New York City.

#### Southern States

##### CHANGES IN FLORIDA HEALTH OFFICERS:

M. LEWIS GRAY, M.D., formerly of Wilmington, N. C., has been appointed health officer of the Jackson-Washington County health unit with headquarters at Marianna. Dr. Gray succeeds C. A. ADAMS, JR., M.D., who resigned to enter private practice.

HARRY W. HOLLINGSWORTH, M.D., has been appointed Health Officer of the Highlands-Glades-Hendry county health unit, with headquarters at Sebring. Dr. Hollingsworth succeeds JAMES HALL, M.D., who resigned to accept a position on the state level.

<sup>\*</sup> Fellow A.P.H.A.

<sup>†</sup> Member A.P.H.A.

ELLSWORTH H. JOHN, M.D.,† former Health Officer of the Meade, Breckenridge, Hancock tri-county health department of Kentucky, has been appointed Health Officer the Suwannee - Dixie - Lafayette County health unit with headquarters at Live Oak. He succeeds WILLIAM G. C. HILL, M.D., who transferred to the Putnam-Flagler county health unit.

PAUL H. JENKINS, M.D., recently released from the Army assumed his duties as county health officer of Marion County on October 1.

H. A. SAUBERLI, M.D.,† formerly with the Tennessee State Health Department has been appointed Health Officer of the Leon County Health Department with headquarters at Tallahassee. Dr. Sauberli succeeds BRUCE UNDERWOOD, M.D.,† who resigned to enter private practice.

JAMES A. GRIDER, JR., M.D.† who for some years has been assigned to the El Paso office of the Pan-American Sanitary Bureau, has been transferred to the U. S. Public Health Service Hospital at Fort Worth, Tex. He is succeeded in El Paso by M. F. HARALSON, M.D., of the Public Health Service who will also succeed him as Secretary of the United States-Mexico Border Public Health Association.

LOWELL S. SELLING, M.D.\* has been appointed consultant on Mental Health, Florida State Board of Health. He is the author of *Men Against Madness*.

JAMES A. SPROLES, JR., M.D., became Director of the Adams County, Miss., Health Department July 1, succeeding KENNETH W. NAVIN, M.D., who became District Supervisor for

the Mississippi State Board of Health. Prior to entering the Army in 1944, Dr. Sproles was Health Officer for Marion County. He has also been health director for Alcorn and Tishomingo counties..

LINFIELD S. WILDER, M.D., will head the new Montana State Mental Hygiene Division, set up by the 1947 legislature as a part of the Division of Hospital Administration. Dr. Wilder's previous experience has been with the U. S. Public Health Service and the St. Louis Psychopathic Hospital.

### Western States

JESSIE M. BIERMAN, M.D.,\* Chief of the Bureau of Maternal and Child Health, California State Department of Health, has resigned to become Professor of Maternal and Child Health at the University of California School of Public Health.

ALMON D. BLANCHAT, M.D., has assumed the post of Linn County, Ore., Health Officer. He has most recently served on active duty with the U. S. Navy with the ultimate rank of lieutenant.

MONROE EATON, M.D., Director of the Virus Laboratory, California State Department of Health, resigned recently to join the faculty of Harvard University Medical School, Boston, Mass., as Associate Professor of Bacteriology.

J. C. GEIGER, M.D.,\* Director of Public Health, San Francisco, Calif., was awarded the Presidential Medal of Merit by His Excellency Victor M. Roman, President of the Republic of Nicaragua, with the following citation: "For medical services to humanity throughout the world and in particular to the Nicaraguan colony residing in San Francisco."

RAYMOND F. GOUDEY,\* formerly of the Department of Water and Power,

\* Fellow A.P.H.A.

† Member A.P.H.A.

City of Los Angeles, Calif., recently accepted the position as Director of the new Sanitary Engineering Division of Truesdail Laboratories, Inc., of Los Angeles.

PORTIA IRICK, R.N.,\* who for some years has been Director of Nursing Service for the Pacific Area, American Red Cross, San Francisco, Calif., has resigned to become Director of the Nursing Division in the New Mexico State Department of Health, Santa Fe.

LEONARD M. KAHL, has been appointed Health Officer for Clatsop County, Oregon.

ALFRED E. KESSLER, M.S.P.H.,\* who has served for several years as Executive Secretary of the Denver Tuberculosis Society, Denver, Colo., has resigned to accept appointment as the Executive Secretary of the Marion County Tuberculosis Association, Indianapolis, Ind.

EVANS G. NELSON, D.D.S., is Director of the Dental Hygiene Section of the Oregon State Board of Health. Graduating from the University of Oregon Dental School in 1945, he was until recently on active duty with the U. S. Navy both in continental U. S. and overseas.

CHARLES M. MCGILL, M.D.,† Director, Industrial Hygiene, Oregon State Board of Health, has resigned to enter private practice of industrial medicine in Tacoma, Wash. He will also act as Medical Director for the Tacoma Smelter. Pending the employment of a full-time director to replace Dr. McGill, CARLYLE THOMPSON, M.D., Director, Preventive Medicine Division, will assume administrative charge of the section. RALPH R. SULLIVAN, M.D.,† Director, Venereal Disease Control, will act as consultant in industrial derma-

tology and KENNETH N. FLOCKE, Industrial Hygiene Engineer, will be in charge of technical activities.

ARTHUR E. RIKLI, M.D.,† Director of the Montana Division of Tuberculosis Control, is taking graduate instruction at Johns Hopkins University in Baltimore.

J. P. WARD, M.D., M.P.H.,\* has been appointed Superintendent of Public Health, State of Arizona, succeeding GEORGE F. MANNING, M.D.,† resigned. Dr. Ward has most recently been Commissioner of Health of Colquitt County, Georgia, and has also been a local health officer in Mississippi. He also served with the Medical Division of UNRRA following the late war.

## DEATHS

WARREN PEARL MORRILL, M.D., Director of Research for the American Hospital Association and long active in hospital work in the United States and Canada, died September 28 at Passavant Memorial Hospital, Chicago, after an illness of two months. He was 70 years old.

HENRY N. OGDEN, of the New York State Public Health Council died September 29. Professor Ogden served on the Public Health Council from the year of its formation, 1913. As a practising engineer, he designed and built sewerage systems in Ithaca and Binghamton, N. Y., Sand Point, Ida., Popham Beach, Me., and Richmond, Va.

## CONFERENCES AND DATES

American Academy of Allergy. Hotel Jefferson, St. Louis, Mo. December 15-17.  
 American Association for the Advancement of Science, Chicago, Ill. December 26-31.  
 American Social Hygiene Association Annual Meeting. Hotel Pennsylvania, New York, N. Y. February 4, 1948.  
 Associated Illinois Milk Sanitarians. Hotel Morrison, Chicago, Ill. December 15.

\* Fellow A.P.H.A.  
 † Member A.P.H.A.

Massachusetts Public Health Association.  
 Boston, Mass. January 29, 1948.  
 National Social Welfare Assembly. Annual  
 Meeting. New York, N. Y. Week of  
 January 26, 1948.  
 Ninth Pan American Child Congress. Caracas,  
 Venezuela. January 5-10, 1948.  
 Planned Parenthood Federation. New York,  
 N. Y. January 26-28, 1948.



**ALWAYS  
READY**

*TO HELP YOU  
STOP CONTAGION*

**DIXIE CUPS**

## Directory of Health Service

### BLACK & VEATCH

CONSULTING ENGINEERS

4706 Broadway

KANSAS CITY, MISSOURI

Sewerage, Sewage Disposal, Water Supply,  
 Water Purification, Electric Lighting, Power  
 Plants, Valuations, Special Investigations, Re-  
 ports and Laboratory Service

E. B. Black N. A. Veatch, Jr. A. P. Learned  
 M. F. Lutz F. M. Veatch R. E. Lawrence  
 E. L. Filby

Established 1843

ANALYSTS BACTERIOLOGISTS  
 CONSULTANTS

Chemical, Bacteriological, Biochemical Analy-  
 ses, Industrial and Sanitary Problems  
 Microbiological Examinations

FOODS WATERS DRUGS BEVERAGES

Scientific investigations

Inquiries invited

BENDINER & SCHLESINGER

LABORATORIES

Third Avenue and Tenth Street  
 New York 3, N. Y.

Telephone: ALgonquin 4-2300

Serving the field of Public Health over 45 yrs.

## Reprints from the American Journal of Public Health

Changing Challenges of Public Health. C.-E. A.  
 Winslow. [March, 1945.] 8 pp. 15c.

Desirable Minimum Functions and Organization Prin-  
 ciples for Health Activities. An official Declaration  
 of the American Public Health Association. [1943.]  
 12 pp. Single copies free. Three or more copies  
 5c each.

Improvement of Local Housing Regulation Under the  
 Law. [Nov., 1942.] 16 pp. 25c.

Laboratory Methods Used in Determining the Value of  
 Sulfadiazine as a Mass Prophylactic Against Menin-  
 gococcal Infections. By Colonel Dwight M.  
 Kuhns, M.C., USA, and Captain Harry A. Feld-  
 man, M.C., AUS. [December, 1943.] 8 pp. 10c.

Landmarks of 1944. Six papers by Abel Wolman,  
 Wilton L. Halverson, William P. Shepard, Hugh  
 R. Leavell, C.-E. A. Winslow, Louis I. Dublin.  
 [January, 1945.] 28 pp. 25c.

Protection of Water and Food Supplies in An  
 Emergency. G. E. Arnold. [Oct., 1942.] 8 pp. 15c.

Surveys of the Nutrition of Populations. John B.  
 Youmans, E. White Patton, and Ruth Kern.  
 [December, 1942 and January, 1943.] 24 pp.  
 Uncovered 20c, covered 25c.

The Present Status of the Control of Air-Borne In-  
 fections. Report of the Subcommittee for the Evalua-  
 tion of Methods and Control of Air-Borne Infections.  
 [January, 1947.] 10 pp. 25c.

Typhoid Vaccine Studies: Revaccination and Duration  
 of Immunity. By Don Longfellow and George F.  
 Luippold. [Nov., 1940.] 7 pp. 15c.

Use of Body Measurements in the School Health  
 Program. Harold C. Stuart and Howard V. Meredith.  
 [December, 1946.] 21 pp. 25c.

Ventilation and Atmospheric Pollution. E. R. Hay-  
 hurst, Chairman. [July, 1943.] 7 pp. Uncovered  
 15c, covered 25c.

Vitamin B Complex. II. Status of Assay Methods  
 and Need of These Substances by Man. [July,  
 1944.] 12 pp. 25c.

**For Free Distribution** Bibliography on Public Health and Allied Subjects, 1947 (25th Ed.). 32 pp.  
 Brief Description of the American Public Health Association.

Order from the Book Service

**AMERICAN PUBLIC HEALTH ASSOCIATION**

1790 Broadway at 58th Street

New York 19, N. Y.

# American Journal of Public Health

## and THE NATION'S HEALTH

---

### Index to Volume 37, 1947

#### *How to Use the INDEX*

This is an Index to all the reading matter in the JOURNAL. It is essentially a title and author Index, although occasional subject headings are provided.

Articles, committee reports, and editorials are listed alphabetically according to the key words in the title, with many cross-references.

Editorials are indexed under "Editorials" as well as alphabetically under the key words in the title.

News notes and fillers are indexed under "News from the Field." This section should be searched as supplemental to the title index.

Matters pertaining to the Association are indexed under "American Public Health Association."

Book reviews are indexed under "Books and Reports."

Obituaries are indexed under "Death Notices."

#### A

	Page
Accident Prevention. See: The Value of Industrial Hygiene. T. Lyle Hazlett, M.D., F.A.C.P. ....	1302
Accreditation. See: Institutions Accredited by the American Public Health Association To Give the Degree of Master of Public Health (Diploma of Public Health in Canada) and Doctor of Public Health for the Academic Year 1947-1948. ....	622, 1627
Achievements of UNRRA as an International Health Organization. Wilbur A. Sawyer, M.D., LL.D. ....	41
Administration Requirements in Public Health. See: Program Audit—A Device for Reflecting Public Health Performance. Evelyn Flook and Joseph W. Mountin, M.D. ....	1137
Administrative and Research Uses of Routine Analyses of Hospital Statistics. Paul M. Densen, D.Sc. ....	1421
Administrative Principles. See: Certain Trends. John B. Grant, M.D. ....	269
Administrative Problems of Industrial Medicine. Editorial. ....	1337
Advertising Methods in Recruitment. Richard Wm. Wallen, Ph.D. Credit Lines. ....	212
Age and Sex Variations in Hospital Utilization. (An Example of Morbidity Data Available from Blue Cross Records.) J. D. Colman, M.E. ....	1307
Aging and Chronic Diseases in Rats and Dogs, Effect of Restricted Feeding upon. C. M. McCay, Ph.D. ....	521
Aging Population, Diseases of an. Editorial. ....	209
Aging Population, Problems of an. Setting the Stage. Louis I. Dublin, Ph.D. ....	152
Care of the Aged and Chronically Ill. Theodore G. Klumpp, M.D. ....	156
Sheltered Care of the Aged. Joseph H. Kinnaman, M.D., M.P.H. ....	163
Preventive Aspects of Cancer Control. Herbert L. Lombard, M.D., M.P.H. ....	170
Public Health Aspects of Diabetes. Hugh L. C. Wilkerson, M.D., M.P.H. ....	177
See: Diseases of an Aging Population. Editorial. ....	209
Air Analysis, Bacteriological Procedures in Sanitary. Report of the Subcommittee on Bacteriological Procedures of the Special Committee on Standard Methods for the Examination of Air, Administered by the Committee on Ventilation and Atmospheric Pollution. W. F. Wells, Chairman. ....	1023
Air-Borne Infections, The Control of. Editorial. ....	450
See: Dust and Its Control as a Means of Disinfection of Air. ....	353
Effect of Ultra-violet Irradiation of Classrooms on Spread of Measles in Large Rural Central Schools. James E. Perkins, M.D., Anne M. Bahlke, M.D., and Hilda Freeman Silverman. ....	529



	Page
Air-Borne Infections, The Present Status of the Control of. Report of the Subcommittee for the Evaluation of Methods to Control Air-borne Infections. James E. Perkins, M.D., Chairman.....	13
Air, disinfection of. See: Cross-infections.	
Air, Dust and Its Control as a Means of Disinfection of. Report of the Standard Methods Committee for the Examination of Germicides and Antibacterial Agents. Clayton C. Loosli, Referee.....	353
See: The Control of Air-borne Infections. Editorial.....	450
Air in Military Establishments, Recent Studies on Disinfection of. Report of the Committee on Sanitary Engineering, National Research Council, Division of Medical Sciences. Abel Wolman, Chairman.....	189
Alcohol Education—Its Needs and Challenges. Joseph Hirsh.....	1574
Alcoholism a Public Health Problem? Editorial.....	1595
Alcoholism. See: Problem drinking.	
Allergy in Brucellosis. Alberto P. León, M.D., M.P.H., and José Sosa, Q.B.P.....	1033
Allocation of Subsidy to Local Health Departments, Criteria for the. John A. Kahl, M.D., M.P.H. ....	199
American Academy of Pediatrics Study of Child Health Services, The: Results to Date. Katherine Bain, M.D., John P. Hubbard, M.D., and Charles L. Williams, Jr., M.D., M.P.H. ....	1297
American College of Surgeons. See: A Future for Industrial Medicine. Leonard J. Goldwater, M.D.....	1247
American Hospital Association, American Medical Association, American Public Health Association, and American Public Welfare Association, Joint Statement of Recommendations by the. Planning for the Chronically Ill.....	1256
American Medical Association, American Public Health Association, American Public Welfare Association and American Hospital Association, Joint Statement of Recommendations by the. Planning for the Chronically Ill.....	1256
American Medical Association, Council on Industrial Health. See: A Future for Industrial Medicine. Leonard J. Goldwater, M.D.....	1247
American Public Health Association, The. Editorial.....	1467
American Public Health Association, American Public Welfare Association, American Hospital Association, and American Medical Association, Joint Statement of Recommendations by the. Planning for the Chronically Ill.....	1256
A.P.H.A. 75th Annual Meeting. See: The Atlantic City Meeting. Editorial.....	1590
American Public Health Association News.....106, 229, 327, 474, 613, 780, 936, 1059, 1195, 1352, 1491, 1617	
Accreditation of Tulane University. List of Accredited Institutions.....	1627
Accreditation. See:	
Institutions Accredited by the American Public Health Association To Give the Degree of Master of Public Health (Diploma of Public Health in Canada) and the Degree of Doctor of Public Health for the Academic Year 1947-1948..	
Announces an Increase in Dues.....	622, 1627
Annual Meeting, 75th, A.P.H.A., Notice of.....228, 327, 474, 621, 787, 940, 1062, 1223	
Hotel Rates. ....	621, 787, 940, 1062, 1223
Preliminary Program. ....	1195
Atwater, Reginald M., M.D., Sedgwick Memorial Medal for 1947 Awarded to.....	1617
Circulation Department, A Message from the.....	623
Committee List, 1946-1947.....	579
Committee on Administrative Practice. See: The 1947 Evaluation Project.....	1064
Constitution and By-Laws. As adopted at the Seventy Fourth Annual Meeting, November 13, 1946. ....	75
Coördinating Committee on Laboratory Methods, An Association.....	936
Elliot, Martha M., M.D., President of American Public Health Association.....	1617
Engineering Section, Restatement of Policy of the.....	112
Evaluation Project, The 1947.....	1064
Fellowship, Applicants for. ....	1218
Fellowship Applications, Closing Date for Submission of.....	623
Governing Council, Nominations for the.....	1066
Health Education Headquarters at Atlantic City?, What Have You for.....	938
Health Officers Section Elects Representatives to Committee on Administrative Practice. ....	232
Ingram, Lt. Col., William T., Appointed Engineering Field Associate for A.P.H.A. Staff. ....	113
Kline, Howard M., Ph.D., of A.P.H.A. Staff on Leave.....	623
Kline, Howard M., Ph.D., Returns to A.P.H.A. Staff from Leave.....	1068
Lasker Awards for 1946, The Recipients of.....	111
Lasker Awards for 1947, The.....	1612
Membership, Applicants for.....114, 229, 327, 475, 613, 781, 941, 1068, 1224, 1352, 1492, 1623	
Message from the Circulation Department, A.....	623
National Health Act of 1947, A.P.H.A. Presents Testimony on.....	1059

# INDEX

5

American Public Health Association News—Continued	Page
Nominations for the Governing Council.....	1066
Officers, 1947-1948.....	1491
Presents Testimony on National Health Act of 1947.....	1059
President of American Public Health Association, Martha M. Eliot, M.D.....	1617
Resolutions Adopted by the Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio. . . . .	107
Resolutions, adopted by the Association at the Seventy-fifth Annual Meeting in Atlantic City, N. J., October 8, 1947.....	1620
Royal Sanitary Institute, Association To Be Represented at Meeting of.....	623
Sedgwick Memorial Medal for 1947 Awarded to Reginald M. Atwater, M.D.....	1617
Southern and Western Branch A.P.H.A. Meetings Fixed for 1948.....	1217
Standard Methods for the Examination of Water and Sewage, Errata to Ninth Edition of the. . . . .	786
Statistical Personnel and Activity, Survey of.....	1067
Survey of Statistical Personnel and Activity.....	1067
Team of Speakers in Western States May and June, 1947.....	474
Udpyke, Elaine, Ph.D. on Staff.....	623
Vocational Counseling and Placement.....	780
Water and Sewage, Errata to Ninth Edition of the Standard Methods for the Examination of. . . . .	786
Western Branch A.P.H.A. Annual Meeting Decorated by Hawaiian Group, Speakers at. . . . .	1217
Western Public Health Meetings—1947 Model.....	1063
Western States May and June, 1947, A.P.H.A. Team of Speakers in.....	474
What Have You for Health Education Headquarters at Atlantic City?.....	938
American Public Welfare Association, American Hospital Association, American Medical Association and American Public Health Association, Joint Statement of Recommendations by the. Planning for the Chronically Ill.....	1256
Ammonium sulfamate. See: Chemical herbicides.	
Anderson, Gaylord W., M.D., Dr.P.H. Foreign and Domestic Trends in Diphtheria.....	1
ANTU. See: Baltimore's Community Rat Control Program. John T. Eblen, Jr., Ph.D....	721
Appraisal of Nutritional Status. Including Some Recent Observations on Iron and Lactobacillus casei Factor (Vitamin M., Folic Acid). William J. Darby, M.D., Ph.D.....	688
Archivist, 1946, Report of the. Anna M. Sexton.....	749
Are Frozen Foods a Public Health Problem? Gerald A. Fitzgerald.....	695
Are Our Health Defenses Crumbling? Editorial.....	455
Army, A Review of Induction and Discharge Examinations for Tuberculosis in the. Desmond R. Long, M.D., Ph.D., and Eugene L. Hamilton.....	412
Army Institute of Pathology, General Review and New Developments at the. Colonel J. E. Ash, M.C., U.S.A.....	815
Army Institute of Pathology, Public Health Aspects of Wartime Studies Conducted at the. Major Ruell A. Sloan, M.C., AUS.....	819
Army Medical Laboratory Organization, The Wartime. Gustave J. Dammin, M.D.....	811
Army Veterinary Laboratories, Wartime Activities of the. Raymond Randall, Colonel, V.C., U.S.A. . . . .	829
Arnstein, Margaret G., R.N., M.P.H. Public Health in England: How It Is Like and Unlike Ours. . . . .	83
See: Public Health as Seen by English Eyes. Editorial.....	72
Ascher, Charles S., LL.B. Regulation of Housing: Hints for Health Officers.....	507
Ash, Colonel J. E., M.C., U.S.A. General Review and New Developments at the Army Institute of Pathology. Wartime Army Medical Laboratory Activities—a Symposium..	815
Astoria Plan for Medical Service in Two New York City Elementary Schools, An Evaluation of the Effectiveness of the. Alfred Yankauer, Jr., M.D.....	853
Atlantic City Meeting, The, Editorial.....	1590
Atmospheric Pollution and Ventilation. See: Air Analysis.	
Atomic Bomb. See: The Value of Industrial Hygiene. T. Lyle Hazlett, M.D., F.A.C.P....	1302
Atwater, Reginald M., M.D., and Shepard, William P., M.D. Today's Key to Better Public Health Service. . . . .	278
Avery, Oswald T., M.D. See: Lasker Awards for 1947.....	1612
Aviation Medicine Industrial Hygiene?, Is Brig. Gen. Eugen G. Reinartz, M.D.....	1130

## B

Bacillus-Calmette-Guérin. See: BCG	
Bacillus mellensis, abortus. See: Brucellosis	
Bacterial Colonies, Charts for Counting. J. Howard Brown, Ph.D.....	206
Bacterial colonies. See: A Darkfield Colony Illuminator. Ronald M. Wood.....	205
Bacterial Food Poisoning, Problems and Errors in Assigning Causes of. G. M. Dack, Ph.D., M.D.....	360
Bacteriological Procedures in Sanitary Air Analysis. Report of the Subcommittee on Bacteriological Procedures of the Special Committee on Standard Methods for the Examination of Air, administered by the Committee on Ventilation and Atmospheric Pollution. W. F. Wells, Chairman.....	1023

	Page
Bacteriological Standards for Dehydrated Foods, A Discussion of. Harry E. Goresline, Ph.D. ....	1277
Bahlke, Anne M., M.D., Silverman, Hilda Freeman, and Perkins, James E., M.D. Effect of Ultra-violet Irradiation of Classrooms on Spread of Measles in Large Rural Central Schools. ....	529
Bain, Katherine, M.D., Hubbard, John P., M.D., and Williams, Charles L., Jr., M.D., M.P.H. The American Academy of Pediatrics Study of Child Health Services: Results to Date. ....	1297
Baltimore's Community Rat Control Program. John T. Emlen, Jr., Ph.D. ....	721
Bang's disease. See: Brucellosis in the United States. Alice C. Evans. ....	139
Barnard, Margaret W., M.D., Dr.P.H. and Brody, William. A New Method of Selecting Health Officers-in-Training. ....	715
Baty, James B., Major, Sn.C., A.U.S., Reinhold, John G., Ph.D., Stokes, Joseph, Jr., M.D., and Neefe, John R., M.D. Inactivation of the Virus of Infectious Hepatitis in Drinking Water. ....	365
Bauer, W. W., M.D. What Is Health Education? ....	641
BCG. Editorial. ....	307
BCG in the Prevention of Tuberculosis in Infants and Children, An Evaluation of the Use of. Milton I. Levine, M.D. ....	1089
BCG. See:	
Research Plans Announced by U. S. Public Health Service. ....	239
Tuberculosis Research Center to Supply BCG Vaccine (News from the Field) ....	1508
Bell, Joseph A., M.D., Emmons, Chester W., Ph.D., and Olson, Byron J., M.D. Studies on Histoplasmosis in a Rural Community. ....	441
Better Public Health Service, Today's Key to. William P. Shepard, M.D., and Reginald M. Atwater, M.D. ....	278
Bidwell, M. H., Chairman. Progress Report of the Committee on Shellfish. (Engineering Section). ....	983
Bierman, Jessie M., M.D., and Caziare, Donald R. California Hearing Conservation Program, The. ....	407
Birmingham, England. See: Maternity and Child Welfare in a Large British City. Jean M. Mackintosh, M.D., D.P.H., D.P.A. ....	499
Bishop, L. K., M.D., Humbert, Walter C., M.D., Tucker, C. B., M.D., and Mosley, K. T., M.D. An Epidemic of an Acute Meningo-encephalitis in Giles County, Tennessee. ....	564
Blackpool, England. See: Public Health as Seen by English Eyes. Editorial. ....	72
Blue Cross Records, An Example of Morbidity Data Available from. Age and Sex Variations in Hospital Utilization. J. D. Colman, M.E. ....	1307
Body Measurements in the School Health Program, Use of. Part III. Supplementary Note Supplying Measurement and Rating Equivalents for Thickness of Skin and Subcutaneous Tissue below Left Scapula and above Left Ilium. Howard V. Meredith, Ph.D., and Harold C. Stuart, M.D. ....	1435
Books and Reports. ....	99, 219, 318, 465, 604, 771, 927, 1051, 1187, 1342, 1480, 1601
Abrams, Charles. The Future of Housing. ....	1192
Acute Infectious Fevers: An Introduction for Students and Practitioners. Alexander Joe. ....	1601
Adams, H. S. Milk and Food Sanitation Practice. ....	1347
Adjustment to Physical Handicap and Illness: A Survey of the Social Psychology of Physique and Disability—Roger G. Barker, Beatrice A. Wright and Mollie R. Gonick. ....	927
Administrative Internship in the Hospital, The. Paul B. Gillen and Charles E. Prall. ....	1603
Aging Successfully. George Lawton. ....	608
Alexander, Franz, and French, Thomas Morton. Psychoanalytic Therapy. ....	465
Allen, Raymond B. Medical Education and the Changing Order. ....	1051
American Association of School Administrators, Twenty-fourth Yearbook of the School Boards in Action. ....	468
American Foundations for Social Welfare. Shelby M. Harrison and F. Emerson Andrews. ....	322
American Hospital, The. E. H. L. Corwin. ....	99
American Public Health Association and American Water Works Association. Standard Methods for the Examination of Water and Sewage (9th. ed.). ....	1053
American Public Health Association. Appraisal Method for Measuring the Quality of Housing, An. Part II. Appraisal of Dwelling Conditions. ....	1480
American Water Works Association and American Public Health Association. Standard Methods for the Examination of Water and Sewage (9th ed.). ....	1053
Anatomy and Physiology for Students of Physiotherapy. (2nd ed.) C. S. V. Smouts and R. J. S. McDowall. ....	1603
Andrews, F. Emerson, and Harrison, Shelby M. American Foundations for Social Welfare. ....	322
Applebaum, Stella B. Baby. A Mother's Manual. ....	772
Appraisal Method for Measuring the Quality of Housing, An. Part II. Appraisal of Dwelling Conditions. American Public Health Association. ....	1480

Books and Reports—Continued	Page
Arthur, Grace. Tutoring as Therapy.....	931
Ashburn, Colonel P. M. The Ranks of Death: A Medical History of the Conquest of America . . . . .	1605
Association of Vitamin Chemists, Inc., The. Methods of Vitamin Assay.....	1347
Babbitt, Harold E. Sewerage and Sewage Treatment. (6th ed.).....	1054
Babies Don't Bounce. Bil Sullivan.....	1192
Baby. A Mother's Manual. Stella B. Applebaum.....	772
Barker, Roger G., Wright, Beatrice A., and Gonick, Mollie R. Adjustment to Physical Handicap and Illness: A Survey of the Social Psychology of Physique and Disability. . . . .	927
Basil, J. Bruno. Tuberculosis Hospital Planning and Construction. (rev. ed.).....	1347
Baughman, H., Lewis, K. M. and Trescher, E. R. Manual of Applied Nutrition (rev. ed.).....	319
Baumgartner, Leona, et al. The Day Care of Little Children in a Big City.....	320
Benedek, Therese. Insight and Personality Adjustment.....	221
Benjamin, Hazel C., and Kelly, Matthew A. Social Security.....	1343
Blester, Lillian L., Griffiths, William, and Pearce, N.O. Units in Personal Health and Human Relations.....	1486
Billings, L. C., Edited by. Manual for Sewage Plant Operators.....	1485
Biochemistry of Cancer. Jesse P. Greenstein.....	771
Blake, Florence G., Jeans, Phillip C., and Rand Winifred. Essentials of Pediatrics (4th ed.).....	99
Bleloch, David H., Pett, Lionel Bradley, and Goodhart, Robert S. Nutrition in Industry. . . . .	1481
Blind Hog's Acorns, A. Carey P. McCord.....	928
Blue Print for a Healthy Community—The Chicago-Cook County Health Survey.....	1603
Body Mechanics in Nursing Arts. Bernice Fash.....	222
Bovine Mastitis. A Symposium. Edited by Ralph B. Little and Wayne N. Plastridge..	771
Bowes, Anna dePlanter, and Church, Charles F. Food Values of Portions Commonly Used. ((6th ed.).....	221
Brieger, E. M. The Papworth Families: A 25 Year Survey.....	1483
Brooks, T. J. A Symposium on the Effects of Soil Elements on Food.....	1606
Brownell, Clifford Lee and Williams, Jesse Feiring. The Human Body.....	773
Bunzel, Joseph H. Negro Housing Needs.....	607
Burchfield, Laverne. Our Rural Communities—A Guidebook to Published Materials on Rural Problems.....	1483
Burdon, Kenneth L. Text Book of Microbiology. (3rd ed.).....	1606
Burns Compiling and Research Organization. Directory of Biological Laboratories. With Buyers' Guide.....	468
Byrd, Oliver E., Compiled by. The Health Instruction Yearbook, 1946.....	322
Cancer Can Be Cured. Alfred J. Cantor.....	222
Cantor, Alfred J. Cancer Can Be Cured.....	222
Carr, Malcolm Wallace. Dentistry: An Agency of Health Service.....	318
Chadwick, Henry D., and Pope, Alton S. The Modern Attack on Tuberculosis.....	932
Chemotherapeutic and Other Studies of Typhus. M. Van den Ende, C. H. Stuart-Harris, F. Fulton, et al.....	772
Chenoweth, Laurence B., and Selkirk, Theodore K. School Health Problems (3rd ed.)..	1481
Chicago-Cook County Health Survey, The. Blue Print for a Healthy Community.....	1603
Child Welfare League of America, Inc. Daytime Care—A Partnership of Three Professions. . . . .	320
Christian, Henry A. The Principles and Practice of Medicine. (16th ed.).....	1346
Church, Charles F., and Bowes, Anna dePlanter. Food Values of Portions Commonly Used. (6th ed.).....	221
Cities Are Abnormal. Edited by Elmer T. Peterson.....	99
Clay, Henry H., with an introduction by Jameson, Sir Wilson. The Sanitary Inspector's Handbook. (6th ed.).....	1607
Clemensen, Jessie Williams, and LaPorte, William Ralph. Your Health and Safety....	467
Clinical Practice in Infectious Diseases (3rd ed.). E. H. R. Harries and M. Mitman...	1485
Colcord, Joanna C., Revision by Howard, Donald S. Your Community.....	932
Committee on Personnel Policies of the National Organization for Public Health Nursing, 1946, Prepared by the. Personnel Policies for Public Health Nursing Agencies. . . . .	319
Committee on State-Local Relations. State-Local Relations.....	1190
Community Centers as Living War Memorials. Compiled by James Dahir.....	469
Compleat Pediatrician, The. Wilbur C. Davison.....	927
Control of Venereal Disease, The. R. D. Vonderlehr, and J. R. Heller, Jr.....	219
Co-Operative Process Among National Social Agencies, The. Ray Johns.....	1343
Corwin, E. H. L., The. American Hospital.....	99
Cox, Charles R. Laboratory Control of Water Purification.....	1345
Cromwell, Gertrude E. The Health of the School Child.....	466
Cureton, Thomas Kirk. Physical Fitness Workbook. (2nd ed.).....	1193
Dahir, James, Compiled by. Community Centers as Living War Memorials.....	469
Daniel Colt Gilman: Creator of the American Type of University. Abraham Flexner..	470
Davison, Wilbur C. The Compleat Pediatrician.....	927

Books and Reports—Continued	Page
Day Care of Little Children in a Big City, The. Leona Baumgartner, et al.....	320
Daytime Care—A Partnership of Three Professions. Child Welfare League of America, Inc.....	320
DDT and the Insect Problem. James C. Leary, William I. Fishbein, and Lawrence C. Salter.....	468
Dentistry: An Agency of Health Service. Malcolm Wallace Carr.....	318
Development of Modern Medicine, The. R. H. Shryock.....	1342
Diabetic Care in Pictures. Helen Rosenthal, Frances Stern, and Joseph Rosenthal....	100
Diehl, Harold S. Textbook of Healthful Living. See: Healthful Living in Films.....	240
Directory of Biological Laboratories. With Buyers' Guide. Burns Compiling and Research Organization.....	468
Dublin, Louis I., and Lotka, Alfred J. The Money Value of a Man. (rev. ed.).....	469
Duran-Reynals, M. L. The Fever Bark Tree.....	221
Eagleton, Clyde. The Forces That Shape Our Future.....	100
Emmons, Chester W., Tsuchiya, Henry M., Skinner, Charles E., Revised by. Henrici's Molds, Yeasts and Actinomycetes.....	1051
Essentials of Pediatrics (4th ed.). Phillip C. Jeans, Winifred Rand, and Florence G. Blake.....	99
Evers, Clifford F., and Tressler, Donald K. The Freezing Preservation of Foods.....	774
Eye Health—A Teaching Handbook for Nurses. National Society for the Prevention of Blindness.....	220
Facts About Nursing, 1946. (9th ed.). Nursing Information Bureau.....	608
Fash, Bernice. Body Mechanics in Nursing Arts.....	222
Federal Security Agency. Practical Nursing—An Analysis of the Practical Nurse Occupation with Suggestions for the Organization of Training Programs.....	1053
Fever Bark Tree, The. M. L. Duran-Reynals.....	221
Fishbein, William I., Salter, Lawrence C., and Leary, James C. DDT and the Insect Problem.....	468
Fitzpatrick, Elizabeth T. and Wheat, Frank Merrill. Health and Body Building.....	774
Five Million Patients. Allen W. Freeman.....	219
Fleas of Western North America. Clarence Andressen Hubbard.....	1342
Fleming, Sir Alexander. Penicillin: Its Practical Application.....	1180
Flexner, Abraham. Daniel Coit Gilman: Creator of the American Type of University..	470
Food Values of Portions Commonly Used. (6th ed.). Anna dePlanter Bowes and Charles F. Church.....	221
Forces That Shape Our Future, The. Clyde Eagleton.....	100
Freeman, Allen W. Five Million Patients.....	219
Free Medical Care. Compiled by Clarence A. Peters.....	102
Freezing Preservation of Foods, The. Donald K. Tressler and Clifford F. Evers.....	774
French, Thomas Morton, and Alexander, Franz. Psychoanalytic Therapy.....	465
Fulton, F., Van den Ende, M., Stuart-Harris, C. H., et al. Chemotherapeutic and Other Studies of Typhus.....	772
Fulton, John F. Harvey Cushing: a Biography.....	775
Future of Housing, The. Charles Abrams.....	1192
Genetics, Medicine, and Man. J. H. Muller, C. C. Little, and Laurence H. Snyder.....	1604
Gesell, Arnold, and Ilg, Frances L. Infant and Child in the Culture of Today.....	467
Geyer, John C. Ground Water in the Baltimore Industrial Area.....	774
Gillen, Paul B., and Prall, Charles E. The Administrative Internship in the Hospital..	1603
Gillett, Lucy H. Nutrition in Public Health.....	466
Gilman, Daniel Coit: Creator of the American Type of University. Abraham Flexner..	470
Gonick, Mollie R., Barker, Roger G., and Wright, Beatrice A. Adjustment to Physical Handicap and Illness: A Survey of the Social Psychology of Physique and Disability.....	927
Goodhart, Robert S., Blleloch, David H., and Pett, Lionel Bradley. Nutrition in Industry.....	1481
Gray, Harold Farnsworth, Edited by. Proceedings and Papers of the Fourteenth Annual Conference of the California Mosquito Control Association.....	321
Greenstein, Jesse P. Biochemistry of Cancer.....	771
Greenwich (Conn.) Community Program "Eat a Good Breakfast" Campaign. Greenwich Nutrition Committee.....	222
Griffiths, William, Pearce, N. O., and Biester, Lillian L. Units in Personal Health and Human Relations.....	1486
Ground Water in the Baltimore Industrial Area. John C. Geyer.....	774
Gruenberg, Benjamin C. How Can We Teach about Sex?.....	606
Hagan, William A., et al. Relation of Diseases in the Lower Animals to Human Welfare, The.....	1055
Hamilton, Alice, and Johnstone, Rutherford T. Industrial Toxicology.....	223
Hansen, Morris H., Compiled under the supervision of. Statistical Abstract of the United States, 1916 (67th ann. ed.).....	1486
Harries, E. H. R., and Mitman, M. Clinical Practice in Infectious Diseases (3rd ed.)..	1485
Harris, Robert S., and Thilmann, Kenneth V., Edited by. Vitamins and Hormones —Advances in Research and Applications, Vol. IV.....	776
Harris, R. W. National Health Insurance in Great Britain 1911-1946.....	1345

Books and Reports—Continued	Page
Harrison, Shelby M., and Andrew's F. Emerson. American Foundations for Social Welfare. . . . .	322
Harvey Cushing: A Biography. John F. Fulton. . . . .	775
Harvey, William Clunie, and Hill, Harry. Insect Pests. (2nd ed.) . . . . .	1606
Hawk, Philip B., Oser, Bernard L., and Summerson, William H. Practical Physiological Chemistry. . . . .	929
Hayes, Edward W. Tuberculosis As It Comes and Goes (2nd ed.) . . . . .	1345
Health and Body Building. Frank Merrill Wheat and Elizabeth T. Fitzpatrick. . . . .	774
Health and Fitness. Florence L. Meredith. . . . .	1054
Health and Welfare Planning Department, A Study published by the. Public Agency-Council Relationships. . . . .	1344
Health Examinations. The Special Committee on Preventive Medicine of the New York County Medical Society. . . . .	605
Health Instruction Yearbook, 1946, The. Compiled by Oliver E. Byrd. . . . .	322
Health Insurance in the United States. Nathan Sinai. . . . .	928
Health of the School Child, The. Gertrude E. Cromwell. . . . .	466
Heidgerken, Loretta A. Teaching in Schools of Nursing. . . . .	1190
Heller, J. R., Jr., and Vonderlehr, R. D. The Control of Venereal Disease. . . . .	219
Henrici's Molds, Yeasts and Actinomycetes. Revised by Charles E. Skinner, Chester W. Emmons, and Henry M. Tsuchiya. . . . .	1051
Hill, Harry, and Harvey, William Clunie. Insect Pests. (2nd ed.) . . . . .	1606
Howard, Donald S., Revision by, and Colcord, Joanna C. Your Community. . . . .	932
How Can We Teach about Sex? Benjamin C. Gruenberg. . . . .	606
Hubbard, Clarence Andressen. Fleas of Western North America. . . . .	1342
Human Body, The. Clifford Lee Brownell and Jesse Feiring Williams. . . . .	773
Hurlin, Ralph G. Scheduled Salaries for Social Work Positions in Hospitals in New York City, December, 1946. . . . .	604
Hygiene. F. L. Meredith. . . . .	465
If You Ask My Advice. Henry Pleasants, Jr. . . . .	930
Ilg, Frances L., and Gesell, Arnold. Infant and Child in the Culture of Today. . . . .	467
Industrial Toxicology. Alice Hamilton and Rutherford T. Johnstone. . . . .	223
Infant and Child in the Culture of Today. Arnold Gesell and Frances L. Ilg. . . . .	467
Insect Microbiology. Edward A. Steinhaus. . . . .	318
Insect Pests. (2nd ed.) William Clunie Harvey and Harry Hill. . . . .	1606
Insight and Personality Adjustment. Therese Benedek. . . . .	221
International Health Conference, New York, N. Y., June 19-July 22, 1946. Report of the U. S. Delegation including the Final Act and Related Documents. . . . .	929
Jameson, Sir Wilson, introduction by, and Clay, Henry H. The Sanitary Inspector's Handbook. (6th ed.) . . . . .	1607
Jeans, Phillip C., Rand, Winifred, and Blake, Forence G. Essentials of Pediatrics (4th ed.) . . . . .	99
Joe, Alexander. Acute Infectious Fevers: An Introduction for Students and Practitioners . . . . .	1601
Johns, Ray. The Co-Operative Process Among National Social Agencies. . . . .	1343
Johnson, Wingate M. The Years After 50. . . . .	1601
Johnstone, Rutherford T., and Hamilton, Alice. Industrial Toxicology. . . . .	223
Kelly, Matthew A., and Benjamin, Hazel C. Social Security. . . . .	1343
Kurtz, Russell M. The Social Work Year Book. (9th ed.) . . . . .	609
Laboratory Control of Water Purification. Charles R. Cox. . . . .	1345
LaPorte, William Ralph, and Clemensen, Jessie Williams. Your Health and Safety. . . . .	467
Lawton, George. Aging Successfully. . . . .	608
Layout, Building Designs and Equipment for Y.M.C.A. Camps. Prepared under direction of John A. Ledlie. . . . .	929
Leary, James C., Fishbein, William I., and Salter, Lawrence C. DDT and the Insect Problem. . . . .	468
Ledlie, John A., Prepared under direction of. Layout, Building, Designs and Equipment for Y.M.C.A. Camps. . . . .	929
Lewis, K. M., Trescher, E. R., Baughman, H. Manual of Applied Nutrition. . . . .	319
Little, C. C., Snyder, Laurence H., and Muller, J. H. Genetics, Medicine, and Man. . . . .	1604
Longhurst, Grace M. Tuberculosis Nursing (2nd ed.) . . . . .	771
Lotka, Alfred J., and Dublin, Louis I. The Money Value of a Man. (rev. ed.) . . . . .	1484
Manual for Public Health Nurses—1947-1948. Minneapolis Division of Public Health Nursing. . . . .	469
Manual for School and Institutional Lunch Rooms (rev.). Ohio Dietetic Association. . . . .	1188
Manual for Sewage Plant Operators. Edited by L. C. Billings. . . . .	224
Manual of Applied Nutrition. (rev. ed.) H. Baughman, K. M. Lewis, and E. R. Trescher. . . . .	1485
Manual of Recommended Practice for Sanitary Control of the Shellfish Industry. Public Health Bulletin No. 295. . . . .	319
Manwell, Reginald D., Russell, Paul F., and West, Luther S. Practical Malariology. . . . .	321
Marsh, Edith L. Nursing Care in Chronic Diseases. . . . .	223
Marshall, James. The Venereal Diseases. A Manual for Practitioners and Students. . . . .	606
Mather, K. Statistical Analysis in Biology. (2nd ed.) . . . . .	101
McFord, Carry P. A Blind Hog's Acorns. . . . .	1607
	928

Books and Reports—Continued	Page
McCrady, Prescott, and Winslow. Water Bacteriology.....	102
McDowall, R. J. S., and Smouts, C. S. V. Anatomy and Physiology for Students of Physiotherapy .....	1603
Medical Addenda: Related Essays on Medicine and the Changing Order.....	1607
Medical Education and the Changing Order. Raymond B. Allen.....	1051
Medical Survey of the Bituminous Coal Industry: Report of the Coal Mines Admin- istration, A.....	1191
Medicine in the Changing Order. Report of the New York Academy of Medicine, Committee on Medicine and the Changing Order.....	1188
Merchant, I. A. Veterinary Bacteriology (3rd ed.).....	1346
Meredith, F. L. Hygiene.....	465
Meredith, Florence L. Health and Fitness.....	1054
Methods of Vitamin Assay. The Association of Vitamin Chemists, Inc.....	1347
Microbial Antagonisms and Antibiotic Substances. (2nd ed.). Selman A. Waksman...	1480
Milk and Food Sanitation Practice. H. S. Adams.....	1347
Minneapolis Division of Public Health Nursing. Manual for Public Health Nurses....	1188
Minnesota State Department of Health and the State Department of Education, prepared by the. Public Health Nursing Functions in the School Health Program..	1344
Mitman, M., and Harries, E. H. R. Clinical Practice in Infectious Diseases (3rd ed.)..	1485
Modern Attack on Tuberculosis, The. Henry D. Chadwick, and Alton S. Pope.....	932
Money Value of a Man, The. (rev. ed.). Louis I. Dublin and Alfred J. Lotka.....	469
Moore, J. E. Penicillin in Syphilis.....	1052
Morris, Evangeline Hall. Public Health Nursing in Syphilis and Gonorrhea.....	1189
Morton's Memoir. W. T. G. Morton.....	605
Muller, J. H., Little, C. C., and Snyder, Laurence H. Genetics, Medicine, and Man..	1604
Municipal Year Book, 1947, The. Edited by Clarence E. Ridley and Orin F. Nolting..	1602
Murine Type of Tubercle Bacillus, The. (The Vole Acid-Fast Bacillus). A. Q. Wells..	1482
National Health Insurance in Great Britain 1911-1946. R. W. Harris.....	1345
National Institute of Health Bulletin. Studies of Typhus Fever.....	1602
National Society for the Prevention of Blindness. Eye Health—A Teaching Handbook for Nurses.....	220
Negro Housing Needs. Joseph H. Bunzel.....	607
New Worlds in Medicine. Edited by Harold Ward.....	101
New York Academy of Medicine, Committee on Medicine and the Changing Order, Report of the. Medicine in the Changing Order.....	1188
New York City Civil Service Department. Survey Report of the Salary Standardiza- tion Board.....	930
New York County, Medical Society, Special Committee on Preventive Medicine of the. Health Examinations.....	605
Nightingale, Florence. Notes on Nursing: What It Is and What It Is Not.....	470
Nolting, Orin F., and Ridley, Clarence E., Edited by. The Municipal Year Book, 1947..	1602
Notes on Nursing: What It Is and What It Is Not. Florence Nightingale.....	470
Nursing Care in Chronic Diseases. Edith L. Marsh.....	606
Nursing for Community Health. Theda L. Waterman.....	932
Nursing Information Bureau. Facts About Nursing, 1946. (9th ed.).....	608
Nutrition and Diet Therapy, A Textbook of Dietetics. (9th ed.). Fairfax T. Proudfit and Corinne Hogden Robinson.....	607
Nutrition in Industry. Lionel Bradley Pett, Roberts S. Goodhart, and David H. Blelloch. ....	1481
Nutrition in Public Health. Lucy H. Gillett.....	466
Ohio Dietetic Association. Manual for School and Institutional Lunch Rooms (rev.)...	224
Old People—Report of a Survey Committee on the Problems of Aging and the Care of Old People. B. Seeborn Rowntree, Chairman.....	1055
Oser, Bernard L., Summerson, William H., and Hawk, Philip B. Practical Phy- siological Chemistry.....	929
Osler. The Principles and Practice of Medicine. (16th ed.) Henry A. Christian.....	1346
Our Rural Communities—A Guidebook to Published Materials on Rural Problems. Laverne Burchfield.....	1483
Papworth Families: A 25 Year Survey, The. E. M. Brieger.....	1483
Pearce, N. O., Blester, Lillian L., and Griffiths, William. Units in Personal Health and Human Relations.....	1486
Penicillin in Syphilis. J. E. Moore.....	1052
Penicillin: Its Practical Application. Sir Alexander Fleming.....	1189
Personality of the Preschool Child, The. A Child's Search for His Self—Werner Wolf. Foreword by Mary Fisher Langmuir.....	604
Personnel Policies for Public Health Nursing Agencies. Prepared by the Committee on Personnel Policies of the National Organization for Public Health Nursing, 1946. ....	319
Peters, Clarence A., Compiled by. Free Medical Care.....	102
Peterson, Elmer T., Edited by. Cities are Abnormal.....	99
Pett, Lionel Bradley, Goodhart, Robert S., and Blelloch, David H. Nutrition in Industry. ....	1481
Physical Fitness Workbook. (2nd ed.). Thomas Kirk Cureton.....	1193

Books and Reports—Continued	Page
Plastring, Wayne N., and Little, Ralph B., Edited by. Bovine Mastitis. A Symposium..	771
Pleasants, Henry, Jr. If You Ask My Advice.....	930
Pope, Alton S., and Chadwick, Henry D. The Modern Attack on Tuberculosis.....	932
Practical Malariology. Paul F. Russell, Luther S. West, and Reginald D. Maxwell...	222
Practical Nursing—An Analysis of the Practical Nurse Occupation with Suggestions for the Organization of Training Programs. Federal Security Agency.....	1053
Practical Physiological Chemistry. Philip B. Hawk, Bernard L. Oser, and William H. Summerson.....	929
Prall, Charles E., and Gillen, Paul B. The Administrative Internship in the Hospital .....	1603
Prescott, Winslow, and McCrady. Water Bacteriology.....	102
Principles and Practice of Medicine (Osler), The. (16th ed.) Henry A. Christian....	1516
Proceedings and Papers of the Fourteenth Annual Conference of the California Mosquito Control Association. Edited by Harold Farnsworth Gray.....	321
Proceedings of the Conference on Preventive Medicine and Health Economics. University of Michigan.....	605
Proudfit, Fairfax T., and Robinson, Corinne Hogden. Nutrition and Diet Therapy, A Textbook of Dietetics (9th ed.).....	607
Psychiatric Interviews with Children. Helen Leland Wilmer.....	220
Psychoanalytic Therapy. Franz Alexander and Thomas Morton French.....	465
Public Agency-Council Relationships. A Study published by the Health and Welfare Planning Department.....	1314
Public Health Bulletin No. 295. Manual of Recommended Practice for Sanitary Control of the Shellfish Industry.....	321
Public Health Nursing Functions in the School Health Program. Prepared by the Minnesota State Department of Health and the State Department of Education....	1314
Public Health Nursing in Syphilis and Gonorrhea. Evangeline Hall Morris.....	1189
Radio—How, When and Why to Use It. Beatrice K. Tolleris.....	775
Rand, Winifred, Blake, Florence G., and Jeans, Philip C. Essentials of Pediatrics (4th ed.).....	99
Ranks of Death: A Medical History of the Conquest of America, The. Colonel P. M. Ashburn .....	1605
Rehabilitation Through Better Nutrition. Tom D. Spies.....	1189
Relation of Diseases in the Lower Animals to Human Welfare, The. William A. Hagan, et al.....	1055
Rice, Thurman B. Sex, Marriage and Family.....	467
Ridley, Clarence D., and Nolting, Orin F., Edited by. The Municipal Year Book, 1947..	1602
Robinson, Corinne Hogden, and Proudfit, Fairfax T. Nutrition and Diet Therapy, A Textbook of Dietetics. (9th ed.).....	607
Robinson, Victor. Victory Over Pain.....	469
Rosenthal, Helen, Stern, Frances, and Rosenthal, Joseph. Diabetic Care in Pictures.....	100
Rosenthal, Joseph, Rosenthal, Helen and Stern, Frances. Diabetic Care in Pictures..	100
Rowntree, B. Seebohm, Chairman. Old People—Report of a Survey Committee on the Problems of Aging and the Care of Old People.....	1055
Russell, Paul F., West, Luther S., and Maxwell, Reginald D. Practical Malariology..	223
Salter, Lawrence C., Leary, James C., and Fishbein, William I. DDT and the Insect Problem.....	468
Sanitary Inspector's Handbook, The. (6th ed.) Henry H. Clay, with an introduction by Sir Wilson Jameson.....	1607
Scheduled Salaries for Social Work Positions in Hospitals in New York City, December, 1946. Ralph G. Hurlin.....	604
School Boards in Action. Twenty-fourth Yearbook of the American Association of School Administrators.....	468
School Health Problems. (3rd ed.). Laurence B. Chenoweth and Theodore K. Selkirk..	1481
Selkirk, Theodore K., and Chenoweth, Laurence B. School Health Problems. (3rd ed.)..	1481
Sewerage and Sewage Treatment. (6th ed.). Harold E. Babbitt.....	1054
Sex, Marriage and Family. Thurman B. Rice.....	467
Shryock, R. H. The Development of Modern Medicine.....	1342
Sinal, Nathan. Health Insurance in the United States.....	928
Skinner, Charles E., Emmons, Chester W., and Tsuchiya, Henry M., Revised by. Henri's Molds, Yeasts and Actinomycetes.....	1051
Smuts, C. S. V., and McDowall, R. J. S. Anatomy and Physiology for Students of Physiotherapy .....	1603
Snyder, Laurence H., Muller, J. H., and Little, C. C. Genetics, Medicine, and Man.....	1604
Social Aspects of Public Housing: An Evaluation of North Carolina Experience. Sanford Winston.....	1482
Social Security. Matthew A. Kelly and Hazel C. Benjamin.....	1343
Social Work Year Book, The. (9th ed.) Russell M. Kurtz.....	609
Spies, Tom D. Rehabilitation Through Better Nutrition.....	1180
Standard Methods for the Examination of Water and Sewage. (9th ed.) American Public Health Association and American Water Works Association.....	1053
Standard Methods of the Division of Laboratories and Research of the New York State Department of Health. Augustus B. Wadsworth.....	1484



## Books and Reports—Continued

	Page
State Central Case Record Systems and Local Case Registers for Tuberculosis. U. S. Public Health Service.....	1604
State-Local Relations. Report of the Committee on State-Local Relations.....	1190
Statistical Abstract of the United States, 1946 (67th ann. ed.). Compiled under the supervision of Morris H. Hansen.....	1486
Statistical Analysis in Biology. (2nd ed.) K. Mather.....	1607
Steinhaus, Edward A. Insect Microbiology.....	318
Stern, Frances, Rosenthal, Joseph, and Rosenthal, Helen. Diabetic Care in Pictures..	100
Stuart-Harris, C. H., Fulton, F., Van den Ende, M., et al. Chemotherapeutic and Other Studies of Typhus.....	772
Studies of Typhus Fever. National Institute of Health Bulletin.....	1602
Sullivan, Bil. Babies Don't Bounce.....	1192
Summerson, William H., Hawk, Philip B., and Oser, Bernard L. Practical Physiological Chemistry.....	929
Survey Report of the Salary Standardization Board. New York City Civil Service Department. ....	930
Symposium on the Effects of Soil Elements on Food, A. T. J. Brooks.....	1606
Teaching in Schools of Nursing. Loretta A. Heidgerken.....	1190
Textbook of Healthful Living. Harold S. Diehl. See: Healthful Living in Films....	240
Text Book of Microbiology. (3rd ed.) Kenneth L. Burdon.....	1606
Thimann, Kenneth V., and Harris, Robert S., Edited by. Vitamins and Hormones—Advances in Research and Applications, Vol. IV.....	776
Tolleris, Beatrice K. Radio—How, When and Why To Use it.....	775
Trescher, E. R., Baughman, H., and Lewis, K. M. Manual of Applied Nutrition. (rev. ed.).....	319
Tressler, Donald K., and Evers, Clifford F. The Freezing Preservation of Foods.....	774
Tsuchiya, Henry M., Skinner, Charles E., Emmons, Chester W., Revised by. Henrici's Molds, Yeasts and Actinomyces.....	1051
Tuberculosis As It Comes and Goes. (2nd ed.) Edward W. Hayes.....	1345
Tuberculosis Control Division of the U.S.P.H.S. Prepared by Field Studies Section of the Tuberculosis in the United States.....	931
Tuberculosis Hospital Planning and Construction. (rev. ed.). J. Bruno Basil.....	1347
Tuberculosis in the United States. Prepared by Field Studies Section of the Tuberculosis Control Division of the U.S.P.H.S.....	931
Tuberculosis Nursing (2nd ed.). Grace M. Longhurst.....	1485
Tutoring as Therapy. Grace Arthur.....	931
United States Delegation, including the Final Act and Related Documents, Report of the. International Health Conference, New York, N. Y., June 19-July 22, 1946. ....	929
Units in Personal Health and Human Relations. Lillian L. Biester, William Griffiths, and N. O. Pearce.....	1486
University of Michigan. Proceedings of the Conference on Preventive Medicine and Health Economics.....	605
U. S. Public Health Service. State Central Case Record Systems and Local Case Registers for Tuberculosis.....	1604
Van den Ende, M., Stuart-Harris, C. H., Fulton, F., et al. Chemotherapeutic and Other Studies of Typhus.....	772
Venereal Diseases, The. A Manual for Practitioners and Students. James Marshall..	101
Veterinary Bacteriology. (3rd ed.) I. A. Merchant.....	1346
Victory Over Pain. Victor Robinson.....	469
Vitamins and Hormones—Advances in Research and Applications, Vol. IV. Edited by Robert S. Harris, and Kenneth V. Thimann.....	776
Vonderlehr, R. D., and Heller, J. R., Jr. The Control of Venereal Disease.....	219
Wadsworth, Augustus B. Standard Methods of the Division of Laboratories and Research of the New York State Department of Health.....	1484
Waksman, Selman A. Microbial Antagonisms and Antibiotic Substances. (2nd ed.)....	1480
Ward, Harold, Edited by. New Worlds in Medicine.....	101
Water Bacteriology. Prescott, Winslow, and McCrady.....	102
Waterman, Theda L. Nursing for Community Health.....	932
Wells, A. Q. The Murine Type of Tubercle Bacillus. (The Role of Acid-Fast Bacillus)	1482
West, Luther S., Maxwell, Reginald D., and Russell, Paul F. Practical Malariaology....	223
What Do You Know About Blindness? Herbert Yahraes.....	931
Wheat, Frank Merrill, and Fitzpatrick, Elizabeth T. Health and Body Building.....	774
Williams, Jesse Feiring, and Brownell, Clifford Lee. The Human Body.....	773
Winslow, C.-E. A. Number. The Yale Journal of Biology and Medicine.....	1187
Winslow, McCrady, and Prescott. Water Bacteriology.....	102
Winston, Sanford. Social Aspects of Public Housing: An Evaluation of North Carolina Experience.....	1482
Witmer, Helen Leland. Psychiatric Interviews with Children.....	220
Wolff, Werner. Personality of the Preschool Child. A Child's Search for His Self. Foreword by Mary Fisher Langmuir.....	604

	Page
<b>Books and Reports—Continued</b>	
Wright, Béatrice A., Gonick, Mollie R., and Barker, Roger G. Adjustment to Physical Handicap and Illness: A Survey of the Social Psychology of Physique and Disability . . . . .	927
Yahraes, Herbert. What Do You Know About Blindness? . . . . .	931
Yale Journal of Biology and Medicine, The. C.-E. A. Winslow Number . . . . .	1187
Years After 50, The. Wingate M. Johnson . . . . .	1601
Your Community. Joanna C. Colcord. A revision by Donald S. Howard . . . . .	932
Your Health and Safety. Jessie Williams Clemensen and William Ralph LaPorte . . . . .	467
<b>Books Received</b> . . . . . 105, 224, 323, 471, 609, 776, 935, 1058, 1193, 1348, 1486, 1608	
Bourke, John J., M.D., M.P.H. Hospital Planning in New York State. Hospital Relations—A Symposium . . . . .	1525
Bovine Disease. See: Brucellosis in the United States. Alice C. Evans . . . . .	139
Bovine Mastitis, Penicillin in the Treatment of Infectious. C. S. Bryan, Ph.D., D.V.M. . . . .	1147
Bread, Enrichment of. See: The Staff of Life . . . . .	211
Breed, R. S., Ph.D., Chairman. Standard Methods for Dairy Products. Report of the Joint Editorial Committee for Standard Methods for the Examination of Dairy Products . . . . .	755
British City, Maternity and Child Welfare in a Large. Jean M. Mackintosh, M.D., D.P.H., D.P.A. . . . .	499
British Ministry of Health. See: The Place of Nutrition in a Public Health Program. Wilson Jameson, K.C.B., M.D. . . . .	1371
Brody, William, and Barnard, Margaret W., M.D., Dr.P.H. A New Method of Selecting Health Officers-in-Training . . . . .	715
Brown, J. Howard, Ph.D. Charts for Counting Bacterial Colonies . . . . .	206
Brucellosis, Allergy in. Alberto P. León, M.D., M.P.H., and José Sosa, Q.B.P. . . . .	1033
Brucellosis in the United States. Alice C. Evans . . . . .	139
See: The Story of Brucellosis. Editorial . . . . .	208
Bryan, C. S., Ph.D., D.V.M. Penicillin in the Treatment of Infectious Bovine Mastitis . . . . .	1147
Buchbinder, Leon, Ph.D., Buck, Theodore C., Jr., Phelps, Percy M., Stone, Raymond V., D.V.M., and Tiedeman, Walter D., M.C.E. Investigations of the Swab Rinse Technic for Examining Eating and Drinking Utensils . . . . .	373
Buchbinder, Leon, Ph.D., and Kleinfeld, Hyman J., Ph.G. Dishwashing Practice and Effectiveness (Swab-rinse Test) in a Large City as Revealed by a Survey of 1,000 Restaurants . . . . .	379
Buck, Theodore C., Jr., Phelps, Percy M., Stone, Raymond V., D.V.M., Tiedeman, Walter D., M.C.E., and Buchbinder, Leon, Ph.D. Investigations of the Swab Rinse Technic for Examining Eating and Drinking Utensils . . . . .	373
Building Codes and Housing Codes: Who Should Enforce Them. Editorial . . . . .	572
Bundesen, Herman N., M.D. What Is Health Education? . . . . .	642
Burney, L. E., M.D., and O'Malley, Martha, M.D. The Hospital Planning and Licensing Programs in Indiana. Hospital Relations—A Symposium . . . . .	1533

## C

Cabinet Post of Health, Education and Security, A. Editorial . . . . .	453
Calibration statistics. See: Morbidity Statistics Through Periodic Surveys of Households. Theodore D. Woolsey . . . . .	1007
California Cities, Comparative Epidemiology of Poliomyelitis in Certain. W. McD. Hammon, M.D., Dr.P.H. . . . .	1545
California Hearing Conservation Program, The. Jessie M. Bierman, M.D., and Donald R. Caziare . . . . .	407
Calories and Specific Nutrients, Ideal Intake of. Fredrick J. Stare, M.D. . . . .	515
Calver, Homer N., and Wingo, Otis T., Jr. Public Opinion Measurement as an Instrument in Public Health Practice . . . . .	426
Canada Sees New Horizons for Health Education. Lt. Col. C. W. Gilchrist, O.B.E., B.D. . . . .	1415
Cancer. See: Atomic Energy, Isotopes.	
Cancer. See: Credit Lines, News from the Field.	
Cancer Control, Preventive Aspects of. Herbert L. Lombard, M.D., M.P.H. . . . .	170
Canine. See: Dogs.	
Canned Foods, Current Trends in Nutrition Research In. R. W. Pilcher, Ph.D., and B. S. Clark, D.Sc. . . . .	702
Cardiolipin and Purified Lecithin as Reagents in Syphilis Serology. Ad Harris and J. F. Mahoney, M.D. . . . .	997
Care of the Aged and Chronically Ill (Problems of an Aging Population). Theodore G. Klumpp, M.D. . . . .	156
Carlquist, Philip R., Major, PC, U.S.A. Development of Shigella Typing by Antigenic Analysis. Wartime Army Medical Laboratory Activities—A Symposium . . . . .	840
Cattle. See: Bovine Disease, Brucellosis.	
Caziare, Donald R., and Bierman, Jessie M., M.D. California Hearing Conservation Program, The . . . . .	407
C. diphtheriae, The Correlation of Laboratory and Clinical Evidence of Virulence of. Martin Frobisher, Jr., Sc.D., Elizabeth I. Parsons, Sc.D., and Elaine Updyke, Sc.D. . . . .	543
Census Tracts in the Analysis of City Health Problems, Use of. Howard Whipple Green . . . . .	538
Certain Trends (The Health Department and Medical Care). John B. Grant, M.D. . . . .	269

	Page
Charts for Counting Bacterial Colonies. J. Howard Brown, Ph.D.....	206
Cheese and Its Relation to Disease. F. W. Fabian, Ph.D.....	987
Chemerdan, Cecilia, Soloway, Mathilde, Ph.D., McFarlane, Vernon H., Ph.D., and Spaulding, E. H., Ph.D. Microbiology of Spray-dried Whole Egg. II. Incidence and Types of Salmonella . . . . .	971
Chemical hazards. See: Nuclear Energy.	
Chemical herbicides. See: Rhus Dermatitis as a Public Health and Health Education Problem. C. E. Turner, Ed.M. Sc.D., Dr.P.H.....	7
Cheney, Bess A., Simpson, Donald F., and Mountin, Joseph W., M.D. Merit System Administration in Official Health Agencies.....	23
Child Health Services, The American Academy of Pediatrics Study of: Results to Date. Katherine Bain, M.D., John P. Hubbard, M.D., and Charles L. Williams, Jr., M.D., M.P.H. . . . .	1297
Child Welfare in a Large British City, Maternity and. Jean M. Mackintosh, M.D., D.P.H., D.P.A. . . . .	499
Children, Standards of Dental Care in Public Health Programs for. Norman F. Gerrie, D.D.S., M.P.H.....	1317
Chlorination. II. Inactivation of Partially Purified Poliomyelitis Virus in Water by. Serge G. Lensen, Ph.D., Morris Rhian, M.S., and Max R. Stebbins.....	869
Chlorination. See: Report of the Committee on Water Supply. Charles R. Cox, Chairman	555
Chronically III, Care of the Aged and. Theodore G. Klumpp, M.D.....	156
Chronically III, Planning for the. Joint Statement of Recommendations by the American Hospital Association, American Medical Association, American Public Health Association, and American Public Welfare Association.....	1256
Chronic diseases. See: Problems of an Aging Population.	
Chronic Illness, The Problems of. Editorial.....	1339
City Health Problems, Use of Census Tracts in the Analysis of. Howard Whipple Green..	538
Clark, B. S., D.Sc., and Pilcher, R. W., Ph.D. Current Trends in Nutrition Research in Canned Foods.....	702
Clark, Dean A., M.D. Group Practice in Preventive Medicine.....	264
Clark, Robert N. Opportunities for the Engineer in Public Health.....	1309
Clarke, J. O. Determination of Filth and Extraneous Matter in Dairy Products.....	728
Clearing House on Public Health Salary Information.....	576, 762, 916, 1175, 1477
Cleveland Five-city Area: See: Use of Census Tracts in the Analysis of City Health Problems. Howard Whipple Green.....	538
Cleveland Meeting, The. Editorial.....	70
Code for Tabulating Causes of Illness, Importance of a Standard. Selwyn D. Collins, Ph.D.	1002
Coleman, Bernard S. The Union Contract and Industrial Hygiene.....	1449
Collins, Selwyn D., Ph.D. Importance of a Standard Code for Tabulating Causes of Illness . . . . .	1002
Colman, J. D., M.E. Age and Sex Variations in Hospital Utilization. (An Example of Morbidity Data Available from Blue Cross Records.).....	1307
Colony charts. See:	
A Darkfield Colony Illuminator. Ronald M. Wood.....	205
Charts for Counting Bacterial Colonies. J. Howard Brown, Ph.D.....	206
Colorado, The People Win for Public Health in. Florence R. Sabin, M.D.....	1311
Colorado Tick Fever. Lloyd Florio, M.D., Dr.P.H., and Mabel O. Stewart.....	293
Committee List, 1946-1947, American Public Health Association.....	579
Committee on the Hygiene of Housing. See: Health Goals for Housing. C.-E. A. Winslow, Dr.P.H. . . . .	653
Committees, Reports on:	
Administrative Practice, Present Status of Vaccination Against Influenza. Report of the Subcommittee on Evaluation of. Thomas Francis, Jr., M.D., Chairman.....	1109
Administrative Practice, Subcommittee on Medical Care. Planning for the Chronically III. Joint Statement of Recommendations by the American Hospital Association, American Medical Association, American Public Health Association, and American Public Welfare Association.....	1256
Archivist, 1946. Anna M. Sexton.....	749
Bacteriological Procedures. Subcommittee of the Special Committee on Ventilation and Atmospheric Pollution (Standard Methods). W. F. Wells, Chairman.....	1023
Coördinating Committee on Standard Methods. Friend Lee Mickle, Sc.D., Chairman....	752
Examination of Dairy Products, Standard Methods for the (Joint Editorial Committee). R. S. Breed, Ph.D., Chairman.....	755
Examination of Frozen Desserts and Ingredients (Joint Standard Methods Committee). Friend Lee Mickle, Sc.D., Chairman.....	757
Examination of Germicides and Antibacterial Agents, Report of the Referee on Suppressive Measures for the Control of Dust, of the Standard Methods Committee for the. Dust and Its Control as a Means of Disinfection of Air. Clayton C. Loessli, Referee . . . . .	353
See: The Control of Air-borne Infections. Editorial.....	450
Examination of Shellfish (Standard Methods). Recommended Procedure for the Bacteriological Examination of Shellfish and Shellfish Waters. Revision of Recommended Methods of Procedure. James Gibbard, Chairman.....	1121

# INDEX

15

Committees, Reports on—Continued	Page
Examination of Water and Sewage (Standard Methods). W. L. Mallmann, Ph.D., Chairman . . . . .	759
Evaluation of Methods to Control Air-borne Infections (Research and Standards). The Present Status of the Control of Air-borne Infections. James E. Perkins, M.D., Chairman . . . . .	13
Foods (Except Milk). Public Health Aspects of Dehydrated Foods. Harry W. von Loesecke, Chairman . . . . .	1334
Housing and Health of the A.P.H.A., and the National Association of Housing Officials, Progress Report by the Joint Committee on. Studies of the Effect of the Provision of Good Housing on Health. Bleecker Marquette, Chairman . . . . .	303
International List of Causes of Death (Sixth Revision). Subcommittee of the Committee on Research and Standards, Edward S. Rogers, M.D., Chairman. Proposed Statistical Classification of Diseases, Injuries, and Causes of Death. Prepared by the United States Subcommittee . . . . .	1017, 1071
Milk and Dairy Products. Food Values of Dairy Products as Affected by Methods of Handling in Production, Distribution, and Use. Riboflavin, Thiamin, Vitamin A. Ethel A. Martin, Chairman . . . . .	1113
Municipal Public Health Engineering. Data on Current and Proposed Local Sanitation Divisions. Leonard M. Board, Chairman . . . . .	901
Professional Education:	
Proposed Report on the Educational Qualifications of Public Health Engineers. William P. Shepard, M.D., Chairman . . . . .	34
Proposed Report on Field Training of Public Health Personnel. William P. Shepard, M.D., Chairman . . . . .	709
Public Health Degrees and Certificates Granted in the United States and Canada During the Academic Year, 1945-1946. William P. Shepard, M.D., Chairman . . . . .	67
Shellfish (Engineering Section). M. H. Bidwell, Chairman . . . . .	983
Water Supply. Charles R. Cox, Chairman . . . . .	555
Common Rat as a Source of Erysipelothrix rhusiopathiae, The. Charles H. Drake, Ph.D., and Elizabeth R. Hall, M.S. . . . .	846
Communicable disease center. See: A National Nerve Center for Public Health Laboratory Service. Editorial . . . . .	745
Communicable diseases. See: Medical Care Programs.	
Community Education in Hawaii Through Health Surveys. Raymond George Nebelung, Dr.P.H. . . . .	875
Comparative Epidemiology of Pollomyelitis in Certain California Cities. W. McD. Hammon, Dr.P.H. . . . .	1545
Compensation. See: Salary Information.	
Compensation plan. See: Merit System Administration in Official Health Agencies. Joseph W. Mountin, M.D., Bess A. Cheney, and Donald F. Simpson . . . . .	23
Conferences and Dates . . . . .	138, 252, 351, 498, 640, 802, 958, 1088, 1246, 1370, 1512, 1643
Congenital Defects in a Year of Epidemic Rubella. R. E. Ober, M.D., R. J. M. Horton, M.D., and Roy F. Feemster, M.D., Dr.P.H. . . . .	1328
Connolly, Mary P. What Is Health Education? . . . . .	642
Constitution and By-Laws. As Adopted at the Seventy-fourth Annual Meeting, November 13, 1946 . . . . .	75
Control of Air-borne Infections, The. Editorial . . . . .	450
See: Dust and Its Control as a Means of Disinfection of Air . . . . .	353
Control of Cross-Infections in Infants' Wards by the Use of Triethylen Glycol Vapor. Clayton G. Loosle, M.D., Margaret H. D. Smith, M.D., Ross L. Gauld, M.D., Oswald H. Robertson, M.D., and Theodore T. Puck, Ph.D. . . . .	1385
Control of Dengue in Hawaii. Charles L. Wilbar, Jr., M.D. . . . .	603
Cooking Procedures to Staphylococcus Food Poisoning, Relation of Certain. Dorothy L. Hussemann, Ph.D., and F. W. Tanner, Ph.D. . . . .	1407
Coördinating Committee on Standard Methods. Friend Lee Mickle, Sc.D., Chairman . . . . .	752
Correlation of Laboratory and Clinical Evidence of Virulence of C. diphtheriae, The. Martin Frobisher, Jr., Sc.D., Elizabeth I. Parsons, Sc.D., and Elaine Updyke, Sc.D. . . . .	543
County Health Department, The Medical Social Worker in a. Jess B. Spielholz, M.D., and Iva Val Brakel . . . . .	733
Cox, Charles R., Chairman. Report of the Committee on Water Supply . . . . .	555
Cox, Gerald J., Ph.D. Oral Environment and Fluorine . . . . .	1151
See: Progress in the Use of Fluorine for the Control of Dental Caries. Editorial . . . . .	1172
Credit Lines . . . . .	91, 212, 313, 459, 599, 766, 921, 1047, 1180, 1507
Abstracts of Current Literature. See: Tuberculosis Index . . . . .	460
Abstracting the World's Medical Literature . . . . .	1049
Advertising Methods in Recruitment . . . . .	212
Aging Process, Minnesota Studies, The . . . . .	214
Aids for Citizen Discussion . . . . .	462
Aids to Discussion of National Health Insurance . . . . .	316
Aids to Health Education in Washington State . . . . .	459
Alcoholism, The Church Considers . . . . .	921
Almanac for Health Education . . . . .	217
Along the Way to School Health . . . . .	464

Credit Lines—Continued	Page
A.M.A. announces annual Gold Medal Award. See: Who Better Deserves It?.....	1597
American Council on Education and the National Social Welfare Assembly. See: The Case for a Federal Department of Health, Education and Security.....	1182
American Hospital Association. See: Community Education in Community Needs.....	94
American Standards for 1947.....	317
American Statistician Makes its Bow, The.....	1598
Annual Reports.....	602
Anthracite Dust Problem Study Published.....	1184
Antivivisectionists, Trouble Ahead for.....	217
Army Medical Library, Microfilm Service of.....	1599
Art Serves Plastic Surgery.....	767
Aurora, Illinois, Immunization in.....	97
Baruch Committee on Physical Medicine. See: Blueprint for Rehabilitation Centers...	93
"Better Health" Makes its Debut.....	1183
Blue Cross, Growth of.....	1048
Blueprint for Rehabilitation Centers.....	93
Botulism, Canning Safeguards against.....	216
British National Association for the Prevention of Tuberculosis. See: Health Horizons	924
Canadian V.D. Films, Wide Use of.....	768
Cancer Capsules.....	92
Cancer Education in Labor Unions.....	97
Cancer Education in Schools.....	97
Cancer Club, Cured.....	214
Cancer Facts.....	97
Cancer Forum, Radio.....	316
Cancer in New Jersey Analyzed.....	1047
Cancer News Is New.....	925
Cancer Quiz, Rotary's.....	924
Canning Safeguards against Botulism.....	216
Carbon Tetrachloride, Tips on the Use of.....	97
Chamber of Commerce Suggests Health Measures.....	218
Chicago Heart Association. See: Seeing an Overworked Heart in Action.....	1183
Children's Bureau Annual Report.....	1048
Chlorination, The OTA Test and Free Residual.....	600
Church Considers Alcoholism, The.....	921
Citizen Interest in the Health Department.....	92
Cleanliness Education.....	599
Colorado's Atom Bomb.....	459
Colquitt County, Georgia. See: Another Approach to Intergovernmental Cooperation...	601
Columbia County, N. Y. See: Annual Reports.....	1599
"Commentator," Introducing the.....	96
Committee for Kentucky.....	316
Communicable Disease Center Programs.....	1597
Community Education in Community Needs.....	94
Community Meets Its Own Needs, A.....	93
Connecticut Cancer Society Handbook.....	600
Connecticut Moves toward Health Units.....	461
Cook County, Ill. See: Annual Reports.....	1599
Credit Where Credit Is Due.....	314
Diabetes Coming under Control?, Is.....	768
Digest of Nutrition Conferences, A.....	1185
Disabled Veterans Not Vocationally Handicapped.....	215
"Disaster" Would Prevent Disaster.....	923
Doctor Shortage, Mississippi Begins to Cut Its Rural.....	214
Doctors Moving to Rural Areas?, Are.....	1049
Duluth's Annual Report.....	94
Economic Security for Nurses.....	460
Education in Hansen's Disease.....	313
Education, The Crisis in.....	313
Emergency Strikes, When an.....	1047
Engineering Curricula, Recommended Changes in.....	923
European Health, Reconstruction toward.....	1182
Evaluation Schedule in Other Fields, The.....	96
Excerpta Medica. See: Abstracting the World's Medical Literature.....	1049
Eye Bank, Two Years of the.....	769
Families Can't Live in Paper Houses.....	1047
Farm Price and Production Problems. See: Aids for Citizen Discussion.....	462
Farm Workers, Health of.....	767
Federal and State Standards for Milk Products.....	924
Federal Department of Health, Education and Security, The Case for a.....	1182
Federal Interagency Committee on Migrant Labor. See: Migrant Labor.....	1183
Films. See: Teacher Aids in Keeping Children Well.....	217
Films, Wide Use of Canadian V.D.....	768

Credit Lines—Continued	Page
Florida Wants Local Health Units.....	216
Food Magic, Modern.....	1599
Food South of the Equator.....	599
Food the World Over.....	603
For You and Yours.....	925
Frasher, Charles B. The Field Consultation Service of the Merit System Unit. "An Investment in Personnel Administration".....	314
Friends Committee on National Legislation for 1947. See: Religion in Action.....	459
Frozen Precooked Foods, Research on.....	924
Garageman Friend?, Do You Have a.....	924
Greenwich Starts a Health Bulletin.....	317
Growing Healthfully.....	1186
Guide to Health Organization in the United States.....	925
Correction.....	98
Handicapped, Disabled Veterans Not Vocationally.....	215
Hansen's Disease, Education in.....	313
Harofe Halvri. See: Hebrew Medical Journal.....	769
Hartford (Conn.) Health Department. See: Annual Reports.....	602
Hawaii, Report from.....	601
Hay Fever in New York, Controlling.....	766
"Health and Welfare's Common Concern with the Multiplicity of Local Government." See: Public Welfare's Stake in Reorganizing Local Government.....	1182
Health Center Idea, Hermann M. Biggs and the.....	218
Health Education for Rural Teachers.....	1597
Health Horizon.....	924
Health Insurance, Aids to Discussion of National.....	316
Health Legislative Record.....	92
Health of Farm Workers.....	767
Health Organization in the United States. Guide to.....	925
"Health Resources" Appears.....	1184
Hebrew Medical Journal.....	769
Hermann M. Biggs and the Health Center Idea.....	218
Hoffman-La Roche, Fifty Years of.....	95
Home Rule in Health.....	96
Hospital Act and Your Community, The.....	1050
Hospital Council of Greater New York, Bulletin of the.....	96
Hospital Survey and Construction Act. See: Michigan's Five Year Plan.....	1048
Housing, Mayors Take a Stand on.....	1050
Housing. See: Families Can't Live in Paper Houses.....	1047
How to Live Longer.....	926
Hurty, John Newell, M.D., of Indiana, Biography of.....	922
Ice Cream, Typhoid from.....	603
Illinois, Influenza Vaccine Studies in.....	214
Immunization in Aurora, Illinois.....	97
Indiana, Public Health Education in.....	93
India, Report from.....	602
Industrial Mass X-Rays.....	767
Influenza Vaccine Studies in Illinois.....	214
In-Service Training, Some Wise Words About.....	1598
Intergovernmental Cooperation, Another Approach to.....	601
Internships for Medical Students in Health Departments in Mississippi, Summer.....	95
Investment in Personnel Administration, An.....	314
Kansas Tells Its Public.....	462
Kentucky, Committee for.....	316
Ladies Home Journal, Public Affairs Department in.....	463
Latin American Interest in Local Health Units.....	1598
Learning About Health in Schools.....	767
Leprosy in Various Parts of the World.....	922
Leprosy. See: Education in Hansen's Disease.....	313
Literature Available on Milk and Other Foods.....	215
Local Health Committees. See: Chamber of Commerce Suggests Health Measures.....	218
Local Health Units, Florida Wants.....	216
Local Health Units, Latin American Interest in.....	1598
Los Angeles Health Department, New Home for.....	1180
Make Your Town Safe!.....	1600
March Record for New Members.....	599
Marion County (Salem, Ore.). See: "Health Resources" Appears.....	1184
Maternity Clinics, For.....	462
Mayors Take a Stand on Housing.....	1050
Medical Care for Families of Yale Student Veterans.....	215
Medicine's Fifth Column.....	1185
Merit System Annual Report, Oklahoma's.....	98
Merit System Unit: Advertising Methods in Recruitment.....	212
Charles B. Frasher. An Investment in Personnel Administration.....	314

Credit Lines—Continued	Page
Michigan's Five Year Plan.....	1048
Microfilm Service of Army Medical Library.....	1599
Migrant Labor.....	1183
Milestones in Tuberculosis Control.....	600
Milk and Other Foods, Literature Available on.....	215
Milk Products, Federal and State Standards for.....	924
Minnesota Activity.....	769
Minnesota Discusses Local Public Health Services.....	1183
Minnesota Studies the Aging Process.....	214
Minnesota's New Health Department Bulletin.....	317
Mississippi Begins to Cut Its Rural Doctor Shortage.....	214
Mississippi, Summer Internships for Medical Students in Health Departments in.....	95
Missouri Recommends County Health Units.....	924
Modern Food Magic.....	1599
"Modern Sewage Treatment".....	1597
Motion Pictures—To Help Instructors, Slidefilms and.....	1600
Multiple Sclerosis Education.....	462
Nashville's New Health Bulletin.....	768
National Education Association. See: The Crisis in Education.....	313
National Foundation for Infantile Paralysis in 1946.....	768
National Planning Association. See: Aids for Citizen Discussion.....	462
National Society for Medical Research. See: Trouble Ahead for Antivivisectionists.....	217
National Tuberculosis Association. See: Reporting on NTA's Million Dollar Operation.....	1185
"Nebraska, For Better Health in." See: Almanac for Health Education.....	217
New Jersey Analyzed, Cancer in.....	1047
New Members, March Record for.....	599
New York Association for the Blind. See: Seeing the Sightless.....	1184
New York State Health Legislative Record.....	92
North Carolina Social Hygiene Society. See: "Better Health" Makes Its Debut.....	1183
NTA's Million Dollar Operation, Report on.....	1185
Nurses, Economic Security for.....	460
Nursing Is a Good Profession.....	1185
Nutrition Charts. "Food makes a difference.".....	603
Nutrition Conferences, A Digest of.....	1185
Nutrition Foundation, The First Five Years of the.....	1184
Nutrition. See: The Story of Johnny and Mary.....	1599
Nutritional Charts.....	770
Odors—and Odors.....	317
Oklahoma Health Department. See: Annual Reports.....	602
Oklahoma's Merit System Annual Report.....	98
Ore; on, Sex Education in.....	1598
Oregon, The State of County Health Services in.....	925
OTA Test and Free Residual Chlorination, The.....	600
"Our Children." See: The Crisis in Education.....	313
Overworked Heart in Action, Seeing an.....	1183
Paraguayan Rural Life: Survey of Food Problems. See: Food South of the Equator..	599
Parents of Spastic Children Form Advisory Council.....	215
Pediatric Journal, New.....	1597
Personnel Administration, An Investment in.....	314
Philadelphia Visiting Nurse Annual Report.....	214
Pittsfield, Mass. See: A Community Meets Its Own Needs.....	93
Pittsfield (Mass.), Citizen Interest in the Health Department.....	92
Plastic Surgery, Art Serves.....	767
"Platform" (Newsweek Magazine). See: Aids to Discussion of National Health Insurance.....	316
Pollution Abatement.....	95
"Post Graduate Medicine" Makes Its Bow.....	461
Proposal for the Solution of the Recruitment Problem, A.....	91
"Prostitution Racket Is Back, The" See: The Right—So Right—Answer!.....	94
Public Welfare's Stake in Reorganizing Local Government.....	1182
Puerto Rico Honors Its Elders.....	1048
Rabies: A Challenge to the Community.....	1050
Radio Cancer Forum.....	316
Radio—How, When and Why to Use It... ..	603
Railroads and Typhoid Fever.....	923
Rat Controller, The.....	460
Reconstruction toward European Health.....	1182
Recruitment Problem, A Proposal for the Solution of the.....	91
Red Cross During Seven War Years, The.....	460
Rehabilitation Centers, Blueprint for.....	93
Rehabilitation?, What Do We Know About.....	1181
Religion in Action.....	459

Credit Lines—Continued	Page
Research on Frozen Precooked Foods.....	924
Rheumatic Fever: Childhood's Greatest Enemy.....	462
Richland County's (Ohio) Annual Report.....	461
Right—So Right—Answer! The.....	94
Rockefeller Foundation 1946 Report.....	921
Rotary's Cancer Quiz.....	924
Rural Areas? Are Doctors Moving to.....	1049
Rural Doctors, More about Training of.....	1049
Rural Teachers, Health Education for.....	1597
Sabin, Florence, M.D. See: Colorado's Atom Bomb.....	459
School Health, Along the Way to.....	464
Scientific Exhibits Be Evaluated?, Can.....	463
Sclerosis Education, Multiple.....	462
Seattle, Wash. See: These Services are Available to You.....	1599
Seeing the Sightless.....	1184
Sewage treatment. See: Pollution Abatement.....	97
Sewage Treatment, Modern.....	1597
Sex Education in Oregon.....	1598
"Slidefilms and Motion Pictures—To Help Instructors".....	1600
Soap and Glycerine. See: Cleanliness Education.....	599
Social Science Research Council "Items".....	1181
Social Security Board, Farewell to the.....	1049
Spastic Children Form Advisory Council, Parents of.....	215
Statistician Makes its Bow, The American.....	1598
St. Louis, Mo. Health Division. See: The Rat Controller.....	460
Story of Johnny and Mary, The.....	1599
Syphilis and Gonorrhea, Wedding Plans, and Protecting the Unborn Baby from Syphilis.....	603
Teacher Aids in Keeping Children Well.....	217
1080, Use of Rodenticide.....	97
See: General index,	
These Services are Available to You.....	1599
Tips on the Use of Carbon Tetrachloride.....	97
Tuberculosis Basic Facts in Basic English.....	925
Tuberculosis Continued, History of.....	1182
Tuberculosis Control, Milestones in.....	600
Tuberculosis Index.....	460
Typhoid Fever, Railroads and.....	923
Typhoid from Ice Cream.....	603
Ulster County (N. Y.) Reports Its Progress.....	602
UNESCO News.....	1185
United Automobile Workers Stethoscope.....	921
United Medical Service Grows.....	770
United Nations Educational and Social Council. See: UNESCO News.....	1185
Uruguay's First Health Center.....	96
Use of Rodenticide 1080.....	97
Vermont State Health Council.....	213
Visiting Nurse Annual Report, Philadelphia.....	214
Wallen, Richard Wm., Ph.D. Advertising Methods in Recruitment.....	212
Washington State, Aids to Health Education in.....	459
Water Supply System for Two Michigan Cities, Joint.....	95
Western Medicine and Surgery, Annals of.....	1047
What You Can Do About Tuberculosis.....	1050
Who Better Deserves It?.....	1597
Wisconsin Crusader Is now Pictorial, The.....	216
Wise Words About In-Service Training, Some.....	1598
Woodward, Oklahoma. See: When an Emergency Strikes.....	1047
World Health Organization, Facts about the.....	763
World's Medical Literature, Abstracting the.....	1049
World Week. See: Learning about Health in Schools.....	767
Worth Quoting.....	926
X-Rays, Industrial Mass.....	767
Yale Student Veterans, Medical Care for Families of.....	215
Young, Clifford Candy, Tribute To.....	768
Youth Serves the Community.....	770
Criteria for the Allocation of Subsidy to Local Health Departments. John A. Kahl, M.D., M.P.H.....	199
Criteria. See: Institutions Accredited by the A.P.H.A.	
Critical Study of Machine Dishwashing. W. L. Mallmann, Ph.D., Paul DeKoning, and Leo Zalkowski.....	390
Cross-Infections in Infants' Wards by the Use of Triethylene Glycol Vapor, Control of, Clayton C. Loosli, M.D., Margaret H. D. Smith, M.D., Ross L. Gauld, M.D., Oswald H. Robertson, M.D., and Theodore T. Puck, Ph.D.....	1285



	Page
Curative medicine. See: Group Practice in Preventive Medicine. Dean A. Clark, M.D....	264
Current Trends in Nutrition Research in Canned Foods. R. W. Pilcher, Ph.D., and B. S. Clark, D.Sc.....	702

## D

Dack, G. M., Ph.D., M.D. Problems and Errors in Assigning Causes of Bacterial Food Poisoning.....	360
Dairy Products as Affected by Methods of Handling in Production, Distribution, and Use, Food Values of. Riboflavin, Thiamin, Vitamin A. Report of the Committee on Milk and Dairy Products. Ethel A. Martin, Chairman.....	1113
Dairy Products, Determination of Filth and Extraneous Matter in. J. O. Clarke.....	728
Dairy Products, Standard Methods for. Report of the Joint Editorial Committee for Standard Methods for the Examination of Dairy Products. R. S. Breed, Ph.D., Chairman.....	755
Dammin, Gustave J., M.D. The Wartime Army Medical Laboratory Organization. War- time Army Medical Laboratory Activities—a Symposium.....	811
Darby, William J., M.D., Ph.D. Appraisal of Nutritional Status. Including Some Recent Observations on Iron and Lactobacillus casei Factor (Vitamin M, Folic Acid).....	688
Darkfield Colony Illuminator, A. Donald M. Wood.....	205
DDT. See: Achievements of UNRRA as an International Health Organization. Wilbur A. Sawyer, M.D., LL.D.....	41
Death Codes. See: International List of Causes of Death.	

Page	Death Notices—Continued	Page
Death Notices .....232, 252, 351, 479, 498, 786, 802, 1088, 1226, 1354, 1496, 1643	Lambert, Sylvester, M.D.....	351
Baldwin, Edward R., M.D.....	Larkey, Charles J., M.D.....	786
Bernfield, Martin, M.D.....	Law, John H., M.D.....	479
Boland, James C., M.D.....	Lay, Walter S., M.D.....	479
Bolt, Frederick E., M.D.....	L'Engle, Edward M., M.D.....	1354
Brands, Frank J.....	Lumsden, Leslie L., M.D.....	1226
Caudill, Fred Welden, M.D.....	Mackey, Clarence H., M.D.....	232
Cook, Claude M., M.D.....	McCain, P.P., M.D.....	479
Cooper, Cathlena A.....	McKay, William M., M.D.....	802, 1354
Crawford, Porter J., M.D.....	Milford, Thomas H.....	232, 252
Crockett, Robert L., M.D.....	Miller, Ira C., M.D.....	1226
Dai, Dr. David S. K.....	Mooney, Major Wilbur Craig.....	232
Dibble, Andrew H., M.D.....	Morrill, Warren Pearl.....	1643
Dowling, Judson D., M.D.....	Morris, Samuel, M.D.....	351, 479
Elby, J. Cyril, M.D.....	Nestlebush, Harry J.....	786
Erickson, Wendell J.....	Ogden, Henry N.....	1643
Exton, William G., M.D.....	Ogilvie, Fred L., M.D.....	786
Faget, Guy H., M.D.....	O'Quinn, Charles A., M.D.....	351, 479
Fernandez-Garcia, Felix E., M.D.....	Parker, Horatio N.....	479
Fisher, Professor Irving.....	Parkinson, George T., M.D.....	640, 786
Fulton, Mary C., R.N.....	Peixoto, Afranio, M.D.....	351
Gaskill, Ina M., R.N.....	Pur, Karel Charles, M.D.....	1226
George, Ruth G., R.N.....	Robinson, Mrs. Mary C.....	1496
Halversen, William V., Ph.D.....	Rose, Anton R., M.D., Ph.D.....	786
Harrington, Francis E., M.D.....	Sargent, Ara N., M.D.....	479
Hershey, Adah L.....	Schilling, Walter, M.D.....	479
Hill, Hibbert Winslow, M.D., D.P.H.....	Setter, Frithjof, Ph.D.....	786
Hogan, William.....	Sheeler, Amanda M., R.N.....	232
Hoge, Dorcas O.....	Smith, Courtney, M.D.....	1082, 1226
Hulburt, Ray G.....	Sparhawk, Sam, M.D.....	479
Irwin, Vernon D., D.D.S.....	Stinson, Bert L., M.D.....	232
Joublanc, Eduardo.....	Townsend, Robert G.....	232
Knott, Arthur D., M.D., D.P.H.....	Warner, Dwight M.....	802
Kowalehik, Stephen A.....	Wolfe, James E., M.D.....	1496
Lally, Bernard V., M.D.....	Wright, Sir Almroth Edward.....	952

Death rates. See: Diseases of an Aging Population.....	209
Deaths of Infants Allegedly Due to Mechanical Suffocation, Sudden. Jacob Werne, M.D. and Irene Garrow, M.D.....	675
Definition of Dental Health Treatment Services for Children. See: Standards of Dental Care in Public Health Programs for Children. Norman F. Gerrie, D.D.S., M.P.H.....	1317
Degrees and Certificates Granted in the United States and Canada During the Academic Year, 1945-1946, Public Health. Report of the Committee on Professional Education. William P. Shephard, M.D., Chairman.....	67
Dehydrated Foods, A Discussion of Bacteriological Standards for. Harry E. Goresline, Ph.D.....	1277

	Page
Dehydrated Foods, Public Health Aspects of. Progress Report of the Committee on Foods (Except Milk). Harry W. von Loesecke, Chairman.....	1334
DeKoning, Paul, Zalkowski, Leo, and Mallmann, W. L., Ph.D. Critical Study of Machine Dishwashing.....	390
Demonstration of Hormesis (Increase in Fatality Rate) by Penicillin. W. A. Randall, Ph.D., C. W. Price, and H. Welch, Ph.D.....	421
Dengue in Hawaii, Control of. Charles L. Wilbar, Jr., M.D.....	663
Dengue. See: Colorado Tick Fever. Lloyd Florio, M.D., Dr.P.H., and Mabel O. Stewart..	293
Densen, Paul M., D.Sc. Administrative and Research Uses of Routine Analyses of Hospital Statistics.....	1421
Dental Care in Public Health Programs for Children, Standards of. Norman F. Gerrie, D.D.S., M.P.H.....	1317
Dental caries. See: Fluorine	
Dental Health, Signs of Progress in. Allen O. Gruebbel, D.D.S., M.P.H.....	1160
Dental Program Planning and Appraisal, Simplified Procedure for the Collection of Basic Data for. John W. Knutson, D.D.S., Dr.P.H.....	1439
Dermatitis as a Public Health and Health Education Problem, Rhus. C. E. Turner, Ed.M., Sc.D., Dr.P.H.....	7
Derryberry, Mayhew, Ph.D. What Is Health Education?.....	643
Determination of Filth and Extraneous Matter in Dairy Products. J. O. Clarke.....	728
Development of Shigella Typing by Antigenic Analysis. Wartime Army Medical Lab- oratory Activities—a Symposium. Philip R. Carlquist, Major, PC., U.S.A.....	840
Diabetes, Public Health Aspects of. Hugh L. C. Wilkerson, M.D., M.P.H.....	177
Diagnostic Procedures for Gonococcal Infection. Summary of a Panel Discussion.....	1461
Diarrhea in a New-Born Nursery Caused by <i>Pseudomonas aeruginosa</i> , An Epidemic of. Charles A. Hunter, Ph.D., and Paul R. Ensign, M.D., M.P.H.....	1166
Diarrhea. See: Gastroenteritis.	
Diet. See: Calories, Food, Nutrition.	
Diphtheria. See: The Correlation of Laboratory and Clinical Evidence of Virulence of C. diphtheriae. Martin Frobisher, Jr., Sc.D., Elizabeth I. Parsons, Sc.D., and Elaine Updyke, Sc.D.....	543
Diphtheria, Foreign and Domestic Trends in. Gaylord W. Anderson, M.D., Dr.P.H.....	1
Diphtheria, Present Recommendations Concerning Treatment and Prophylaxis of. Franklin H. Top, M.D., M.P.H.....	549
Discussion of Bacteriological Standards for Dehydrated Foods, A. Harry E. Goresline, Ph.D.....	1277
Diseases in Rats and Dogs, Effect of Restricted Feeding upon Aging and Chronic. C. M. McCay, Ph.D.....	521
Diseases of an Aging Population. Editorial.....	209
Dishwashing, Critical Study of Machine. W. L. Mallmann, Ph.D., Paul DeKoning, and Leo Zalkowski.....	390
Dishwashing Practice and Effectiveness (Swab-rinse Test) in a Large City as Revealed by a Survey of 1,000 Restaurants. Hyman J. Kleinfeld, Ph.G. and Leon Buchbinder, Ph.D.....	379
Dishwashing. See: Food Utensils, Restaurant.	
Disinfection of Air, Dust and Its Control as a Means of. Report of the Standard Methods Committee for the Examination of Germicides and Antibacterial Agents. Clayton C. Loosli, Referee.....	353
See: The Control of Air-borne Infections. Editorial.....	450
Disinfection of Air in Military Establishments, Recent Studies on. Report of the Com- mittee on Sanitary Engineering, National Research Council, Division of Medical Sciences. Abel Wolman, Chairman.....	189
Dixon, M. K., Misner, J., Kendrick, P. L., Sc.D. and Eldering, Grace, Sc.D. Mouse Pro- tection Tests in the Study of Pertussis Vaccine: A Comparative Series Using the Intracerebral Route for Challenge.....	803
Dogs, Effect of Restricted Feeding Upon Aging and Chronic Diseases in Rats and. C. M. McCay, Ph.D.....	521
Domestic Trends in Diphtheria, Foreign and. Gaylord W. Anderson, M.D., Dr.P.H.....	1
Dowdy, Andrew H., M.D. Safe and Beneficial Utilization of Nuclear Energy.....	1291
Drake, Charles H., Ph.D., and Hall, Elizabeth R., M.S. The Common Rat as a Source of <i>Erysipelothrix rhusiopathiae</i> .....	846
Dried milk. See: The Problem of Reconstituted Milk. George H. Hauser, M.D., and William H. King.....	1284
Drinking—A Public Health and Municipal Responsibility, Problem. Lyman C. Duryea, M.D., M.P.H.....	1567
Drinking water. See: Hepatitis	
Drinking water standards. See: Water supply.	
Droplet nuclei. See: Air-borne Infections; Disinfection of air, dust.	
Drummond, Sir Jack. See: The Lasker Awards for 1947.....	1612
Dublin, Louis I., Ph.D. Setting the Stage (Problems of an Aging Population).....	152
Dublin, Thomas D., M.D., Dr.P.H. What Is Health Education?.....	644
Dunn, Halbert L., M.D., Ph.D. Health and Social Statistics for the City.....	739
Duryea, Lyman C., M.D., M.P.H. Problem Drinking—A Public Health and Municipal Responsibility.....	1567
See: Alcoholism A Public Health Problem? Editorial.....	1595

	Page
Dust and Its Control as a Means of Disinfection of Air. Report of the Referee on Sup- pressive Measures for the Control of Dust, of the Standard Methods Committee for the Examination of Germicides and Antibacterial Agents. Clayton C. Loosli, Referee..	353
See: The Control of Air-borne Infections. Editorial.....	450
Dust. See: Air-borne Infections, disinfection of air.	
Dust Fever. See: Brucellosis in the United States. Alice C. Evans.....	139

## E

Eating and drinking utensils. See: Dishwashing, Restaurants.	
Eating and Drinking Utensils, Investigations of the Swab Rinse Technic for Examining. Leon Buchbinder, Ph.D., Theodore C. Buck, Jr., Percy M. Phelps, Raymond V. Stone, D.V.M., and Walter D. Tiedeman, M.C.E.....	373
Eating Utensils, An Epidemic of Mild Gastroenteritis of Unknown Etiology Presumably Spread by Contaminated. M. Allen Pond and John S. Hathaway, M.D.....	1402
Editorials.....	70, 208, 307, 450, 570, 744, 909, 1041, 1170, 1337, 1467, 1590
Administrative Problems of Industrial Medicine.....	1337
See: A Future for Industrial Medicine. Leonard J. Goldwater, M.D.....	1247
Aging Population, Diseases of an.....	209
Air-Borne Infections, The Control of. See: Dust and Its Control as a Means of Disinfection of Air.....	450
Alcoholism A Public Health Problem?.....	1593
American Public Health Association, The.....	1467
Are Our Health Defenses Crumbling?.....	455
Atlantic City Meeting, The.....	1590
BCG.....	307
Blackpool, England. See: Public Health as Seen by English Eyes.....	72
Brucellosis, The Story of.....	208
See: Brucellosis in the United States.....	139
Building Codes and Housing Codes: Who Should Enforce Them.....	572
Cabinet Post of Health, Education and Security, A.....	453
Chronic Illness, The Problems of.....	1339
Cleveland Meeting The.....	70
Communicable Disease Center. See: A National Nerve Center for Public Health Laboratory Service.....	745
Control of Air-Borne Infections, The.....	450
See: Dust and Its Control as a Means of Disinfection of Air.....	353
Diseases of an Aging Population.....	209
"Equalization" Program, Principles of a State.....	310
Evaluation of School Health Service, A Notable.....	913
See: An Evaluation of the Effectiveness of the Astoria Plan for Medical Service in Two New York City Elementary Schools.....	853
Field Studies, The Importance of Controls in Public Health.....	72
Fluorine for the Control of Dental Caries, Progress in the Use of.....	1172
Folks, Homer, Statesman Emeritus.....	570
Forgotten Mind, The.....	1170
Frozen Foods? Standards for.....	312
Full-time Health Service in Illinois.....	209
Garbage Grinder, The Kitchen.....	573
Health Council, The Health Officer and the.....	1041
See: Health Councils in Local Communities.....	959
Health, Education and Security, A Cabinet Post of.....	453
Health Education? What is.....	744
See: What is Health Education? A Symposium.....	641
Health Officer and the Health Council, The.....	1041
See: Health Councils in Local Communities.....	959
Housing Codes: Who Should Enforce Them, Building Codes and.....	572
Illinois, Full-time Health Service in.....	209
Importance of Controls in Public Health Field Studies, The.....	72
Industrial Medicine, Administrative Problems of.....	1337
See: A Future for Industrial Medicine. Leonard J. Goldwater, M.D.....	1247
Ingenious Yardstick for Measuring Health Status, An.....	747
Kitchen Garbage Grinder, The.....	573
Laboratory Service, A National Nerve Center for Public Health.....	745
Latin America, Training Health Workers for.....	1340
Maternal Mortality, The Victory Over.....	1476
Measuring Health Status, An Ingenious Yardstick for.....	747
Meat Inspection, Mysteries of.....	1174
Mental Hygiene. See: The Forgotten Mind.....	1170
Mysteries of Meat Inspection.....	1174
National Nerve Center for Public Health Laboratory Service, A.....	745

Editorials—Continued	Page
Notable Evaluation of School Health Service, A.....	913
Nursing Education Is A Professional Problem.....	1046
Nutrition and Vital Resistance.....	915
Planning For the Control of Stream Pollution.....	1042
President Truman's Message to Congress on a National Health Program. See: Who Is Un-American Now? . . . . .	1592
Presidents of the American Public Health Association.....	1475
Principles of a State "Equalization" Program.....	310
Problems of Chronic Illness, The.....	1339
Progress in the Use of Fluorine for the Control of Dental Caries.....	1172
Public Health as Seen by English Eyes.....	72
See: Public Health Work in England: How It Is Like and Unlike Ours.....	83
Restaurant Sanitation Goes Scientific.....	574
Salaries. See: Are Our Health Defenses Crumbling?.....	455
School Health Service, A Notable Evaluation.....	913
Standard Methods for the Examination of Dairy Products. See: Two Ninths.....	909
Standard Methods for the Examination of Water and Sewage. See: Two Ninths....	909
Standards for Frozen Foods?.....	312
State "Equalization" Program, Principles of a.....	310
Stream Pollution, Planning for the Control of.....	1042
Training Health Workers for Latin America.....	1340
Tuberculosis. See: BCG.....	307
Staff of Life, The.....	211
Story of Brucellosis, The.....	208
See: Brucellosis in the United States.....	139
Two Ninths.....	909
Un-American Now?, Who Is.....	1592
Victory over Maternal Mortality. The.....	1476
Vital Resistance, Nutrition and.....	915
What Is Health Education?.....	744
See: What Is Health Education? A Symposium.....	641
Who Is Un-American Now?.....	1592
Education in Hawaii through Health Surveys, Community. Raymond George Nebelung, Dr.P.H. . . . .	875
Effect of Restricted Feeding upon Aging and Chronic Diseases in Rats and Dogs. C. M. McCay, Ph.D. ....	521
Effect of Ultra-violet Irradiation of Classrooms on Spread of Measles in Large Rural Central Schools. James E. Perkins, M.D., Anne M. Bahlke, M.D., and Hilda Freeman Silverman.....	529
Egg, Microbiology of Spray-dried Whole. II. Incidence and Types of Salmonella. Mathilde Solowey, Ph.D., Vernon H. McFarlane, Ph.D., E. H. Spaulding, Ph.D., and Cecilia Chemerda.....	971
Eldering, Grace, Sc.D., Dixon, M. K., Misner, J., and Kendrick, P. L., Sc.D. Mouse Protection Tests in the Study of Pertussis Vaccine: A Comparative Series Using the Intracerebral Route for Challenge.....	803
Ellis, Paul F. Newspapers—Public Health Allies.....	907
EMIC. See: Experience and Lessons from Emergency Maternity and Infant Care. Nathan Sinai, Dr.P.H.....	1097
Emlen, John T., Jr., Ph.D. Baltimore's Community Rat Control Program.....	721
Emmons, Chester W., Ph.D., Olson, Byron J., M.D., and Bell, Joseph A., M.D. Studies on Histoplasmosis in a Rural Community.....	441
Employees' Health Education Conferences. See: The Nurse's Role in Health Education in Industry. Bethel J. McGrath, R.N.....	298
Employment Service.....120, 233, 332, 480, 621, 789, 945, 1072, 1227, 1355, 1497, 1628	
Engineer in Public Health, Opportunities for the. Robert N. Clark.....	1399
Engineers, Proposed Report on the Educational Qualifications of Public Health. Report by the Committee on Professional Education. William P. Shepard, M.D., Chairman....	34
England. See: Britain, British, (News From the Field) Great Britain	
England. See: Public Health as Seen by English Eyes. Editorial.....	72
Public Health Work in England: How It is Like and Unlike Ours. Margaret G. Arnstein, R.N., M.P.H.....	83
Ensign, Paul R., M.D., M.P.H., and Hunter, Charles A., Ph.D. An Epidemic of Diarrhea in a New-Born Nursery Caused by Pseudomonas aeruginosa.....	1166
Epidemic of an Acute Meningo-encephalitis in Giles County, Tennessee, An. Walter C. Humbert, M.D., C. B. Tucker, M.D., K. T. Mosley, M.D., and L. K. Bishop, M.D.....	564
Epidemic of Diarrhea in a New-Born Nursery Caused by Pseudomonas aeruginosa, An. Charles A. Hunter, Ph.D., and Paul R. Ensign, M.D., M.P.H.....	1166
Epidemic of Mild Gastroenteritis of Unknown Etiology Presumably Spread by Contaminated Eating Utensils, An. M. Allen Pond and John S. Hathaway, M.D.....	1402
Epidemic Rubella, Congenital Defects in a Year of. R. E. Ober, M.D., R. J. M. Horton, M.D., and Roy F. Feemster, M.D., Dr.P.H.....	1328
"Equalization" Program, Principles of a State. Editorial.....	310
Erysipelothrix rhusiopathiae, The Common Rat as a Source of. Charles H. Drake, Ph.D., and Elizabeth R. Hall, M.S.....	846

	Page
Evaluation of Health Procedures, Statistics in the Planning and. Hugo Muench, M.D., Dr.P.H. ....	1273
Evaluation of Local Health Work, The. Roscoe P. Kandle, M.D., M.P.H. ....	1143
Evaluation of School Health Service, A Notable. Editorial. ....	913
Evaluation of Substandard Housing, Need for Systematic. M. Allen Pond. ....	967
Evaluation of the Effectiveness of the Astoria Plan for Medical Service in Two New York City Elementary Schools, An. Alfred Yankauer, Jr., M.D. ....	853
See: A Notable Evaluation of School Health Services. Editorial. ....	913
Evaluation of the Use of BCG in the Prevention of Tuberculosis in Infants and Children, An. Milton I. Levine, M.D. ....	1089
See: Letter to the Editor. ....	1479
Evans, Alice C. Brucellosis in the United States. ....	139
See: The Story of Brucellosis. Editorial. ....	208
Examination of Frozen Desserts and Ingredients. Report of the Joint Standard Methods Committee on Frozen Desserts and Ingredients. Friend Lee Mickle, Sc.D., Chairman. ....	757
Examination of Germicides and Antibacterial Agents (Standard Methods). Dust and Its Control as a Means of Disinfection of Air. Clayton C. Loosli, Referee. ....	353
See: The Control of Air-borne Infections. Editorial. ....	450
Examination of Water and Sewage. Report of the Standard Methods Committee on Water and Sewage. W. L. Mallmann, Ph.D. Chairman. ....	759
Executive Board of the American Public Health Association to the Governing Council 1915-1946, Report of the Chairman of the. Abel Wolman, Dr.Eng. ....	59
Experience and Lessons from Emergency Maternity and Infant Care. Nathan Sinai, Dr.P.H. ....	1097
Experience with Vaccination Against Influenza in the Spring of 1947. Thomas Francis, Jr., M.D., Jonas E. Salk, M.D., and J. J. Quilligan, Jr., M.D. ....	1013

## F

Fabian, F. W., Ph.D. Cheese and Its Relation to Disease. ....	987
False positives. See: Universal Serologic Reactivity with Lipid Antigens, Reuben L. Kahn, Sc.D. ....	283
Farm Security and Administration. See: Rural Prepayment Medical Care Plans and Public Health Agencies. Mark Ziegler, M.D., E. Richard Weinerman, M.D., and Milton I. Roemer, M.D., M.P.H. ....	1578
Feeding upon Aging and Chronic Diseases in Rats and Dogs, Effect of Restricted. C. M. McCay, Ph.D. ....	521
Feemster, Roy F., M.D., Dr.P.H., Ober, R. E., M.D., and Horton, R. J. M., M.D. Congenital Defects in a Year of Epidemic Rubella. ....	1328
Field Studies Relating to Immunity in Infectious Hepatitis and Homologous Serum Jaundice. Ross L. Gauld, M.B., Dr.P.H. ....	400
Field Studies, The Importance of Controls in Public Health. Editorial. ....	72
Field Training of Public Health Personnel, Proposed Report on. Committee on Professional Education. William P. Shepard, M.D., Chairman. ....	709
Films. See: Canada Sees New Horizons for Health Education. Lt.-Col. C. W. Gilchrist, O.B.E., E.D. ....	1415
Fifth and Extraneous Matter in Dairy Products, Determination of. J. O. Clarke. ....	728
Fitzgerald, Gerald A. Are Frozen Foods a Public Health Problem? ....	695
Fleas. See: UNRRA	
Flook, Evelyn and Mountin, Joseph W., M.D. Program Audit—A Device for Reflecting Public Health Performance. ....	1137
Florio, Lloyd, M.D., Dr.P.H., and Stewart, Mabel O. Colorado Tick Fever. ....	293
Flour, enrichment of. See: The Staff of Life. ....	211
Fluorides from Water, Methods of Removing. F. J. Maier, B.S.M.E., B.S.C.E. ....	1559
Fluorine, Oral Environment and. Gerald J. Cox, Ph.D. ....	1151
Fluorine for the Control of Dental Caries, Progress in the Use of. Editorial. ....	1172
Folic acid. See: Appraisal of Nutritional Status. Including Some Recent Observations on Iron and Lactobacillus casei Factor (Vitamin M, Folic Acid). William J. Darby, M.D., Ph.D. ....	688
Folke, Homer, Statesman Emeritus. Editorial. ....	570
Food handling equipment. See: A Method for Assessing the Sanitizing Efficiency of Quaternary Ammonium and Hypochlorite Products. C. K. Johns, Ph.D. ....	1322
Food Poisoning. See: Cheese and Its Relation to Disease. F. W. Fabian, Ph.D. ....	987
Food Poisoning, Problems and Errors in Assigning Causes of Bacterial. G. M. Dack, Ph.D., M.D. ....	360
Food Poisoning, Relation of Certain Cooking Procedures to Staphylococcus. Dorothy L. Husemann, Ph.D., and F. W. Tanner, Ph.D. ....	1407
Food. See: Calories, Diet, Nutrition.	
Food Utensil Sanitation. See: Investigation of the Swab Rinse Technique for Examining Eating and Drinking Utensils. Leon Buchbinder, Ph.D., Theodore C. Buck, Jr., Percy M. Phelps, Raymond V. Stone, D.V.M., and Walter D. Tiedeman, M.C.E. ....	373

	Page
Food Utensil Sanitation. See:—Continued	
Dishwashing Practice and Effectiveness (Swab-rinse Test) in a Large City as Revealed by a Survey of 1,000 Restaurants. Hyman J. Kleinfeld, Ph.G. and Leon Buchbinder, Ph.D.	379
Critical Study of Machine Dishwashing. W. L. Mallmann, Ph.D., Paul DeKoning, and Leo Zaikowski.	390
Food utensils. See: Dishwashing.	
Food Values of Dairy Products as Affected by Methods of Handling in Production, Distribution, and Use. Riboflavin, Thiamin, Vitamin A. Report of the Committee on Milk and Dairy Products. Ethel A. Martin, Chairman.	1113
Foods, A Discussion of Bacteriological Standards for Dehydrated. Harry E. Goresline, Ph.D.	1277
Foods a Public Health Problem? Are Frozen. Gerald M. Fitzgerald.	695
Foods, Current Trends in Nutrition Research in Canned. R. W. Pilcher, Ph.D., and B. S. Clark, D.Sc.	702
Foods, Public Health Aspects of Dehydrated. Progress Report of the Committee on Foods (Except Milk). Harry W. von Loesecke, Chairman.	1334
Foreign and Domestic Trends in Diphtheria. Gaylord W. Anderson, M.D., Dr.P.H.	1
Forgotten Mind, The. Editorial.	1170
Fox, Elizabeth G., R.N. What Is Health Education?	645
Francis, Thomas, Jr., M.D., Chairman. Report of the Subcommittee on Evaluation of Administrative Practices, Committee on Administrative Practice. Present Status of Vaccination Against Influenza.	1109
Francis, Thomas, Jr., M.D. See: The Lasker Awards for 1947.	1612
Francis, Thomas, Jr., M.D., Salk, Jonas E., M.D. and Quilligan, J. J., Jr., M.D. Experience with Vaccination Against Influenza in the Spring of 1947.	1013
Fraser, Charles B. The Field Consultation Service of the Merit System Unit. "An Investment in Personnel Administration." Credit Lines.	314
French West Africa by the Method of the Pasteur Institute of Dakar, Yellow Fever Vaccination, Simple or Associated with Vaccination Against Smallpox, of the Populations of. M <sup>é</sup> decin-G <sup>é</sup> n <sup>é</sup> ral Maurice Peltier.	1026
Frobisher, Martin, Jr., Sc.D., Parsons, Elizabeth I., Sc.D., Updyke, Elaine, Sc.D. The Correlation of Laboratory and Clinical Evidence of Virulence of <i>C. diphtheriae</i> .	543
Frozen Foods a Public Health Problem? Are. Gerald A. Fitzgerald.	695
Frozen Foods? Standards for. Editorial.	312
Full-time Health Service in Illinois. Editorial.	209
Functions of Standing Orders for the Nurses in Industry. Irving R. Tabershaw, M.D., and Margaret S. Hargreaves, R.N.	1430
Future for Industrial Medicine, A. Leonard J. Goldwater, M.D.	1247
See: Administrative Problems of Industrial Medicine. Editorial.	1337
G	
Garbage Grinder, The Kitchen. Editorial.	573
Garrow, Irene, M.D., and Werne, Jacob, M.D. Sudden Deaths of Infants Allegedly Due to Mechanical Suffocation.	675
Gastroenteritis of Unknown Etiology Presumably Spread by Contaminated Eating Utensils, An Epidemic of Mild. M. Allen Pond and John S. Hathaway, M.D.	1402
Gauld, Ross L., M.B., Dr.P.H. Field Studies Relating to Immunity in Infectious Hepatitis and Homologous Serum Jaundice.	400
Gauld, Ross L., M.D., Robertson, Oswald H., M.D., Puck, Theodore T., Ph.D., Loosle, Clayton, G., M.D., and Smith, Margaret H. D., M.D. Control of Cross-Infections in Infants' Wards by the Use of Triethylene Glycol Vapor.	1385
General Review and New Developments at the Army Institute of Pathology. Wartime Army Medical Laboratory Activities—A Symposium. Colonel J. E. Ash, M.C., U.S.A.	815
German measles. See: Rubella.	
Germicides. See: A Method for Assessing the Sanitizing Efficiency of Quaternary Ammonium and Hypochlorite Products. C. K. Johns, Ph.D.	1322
Gerrie, Norman F., D.D.S., M.P.H. Standards of Dental Care in Public Health Programs for Children.	1317
Gibbard, James, Chairman. Recommended Procedure for the Bacteriological Examination of Shellfish and Shellfish Waters. Revision of Recommended Methods of Procedure. Standard Methods Committee for the Examination of Shellfish.	1121
Gilchrist, Lt. Col. C. W., O.B.E., E.D. Canada Sees New Horizons for Health Education.	1415
Giles, County, Tennessee, An Epidemic of an Acute Meningo-encephalitis in. Walter C. Humbert, M.D., C.B. Tucker, M.D., K. T. Mosley, M.D., and L. K. Bishop, M.D.	564
Glycol vapor disinfection. See: Disinfection of air.	
Goat Fever. See: Brucellosis in the United States. Alice C. Evans.	139
Goldwater, Leonard J., M.D. A Future for Industrial Medicine.	1247
Gonococcal Infection, Diagnostic Procedures for. Summary of a Panel Discussion.	1461
González-Rivera, Manuel, M.D. Health Education in Mexico.	849
Goresline, Harry E., Ph.D. A Discussion of Bacteriological Standards for Dehydrated Foods.	1277

	Page
Grant, John B., M.D. Certain Trends. A symposium.....	269
Greenberg, Morris, M.D., Pellitteri, Ottavio J., M.D., and Jellison, William L. Rickettsial-pox—A Newly Recognized Rickettsial Disease. III. Epidemiology.....	860
Green, Howard Whipple. Use of Census Tracts in the Analysis of City Health Problems..	538
What Is Health Education?.....	646
Groom, William S. What Is Health Education?.....	647
Group Practice in Preventive Medicine. (The Health Department and Medical Care).	
Dean A. Clark, M.D.....	264
Gruebbl, Allen O., D.D.S., M.P.H. Signs of Progress in Dental Health.....	1160

## H

Hall, Elizabeth R., M.S., and Drake, Charles H., Ph.D. The Common Rat as a Source of Erysipelothrix rhusiopathiae.....	846
Hamilton, Alice, M.D. See: The Lasker Awards for 1947.....	1612
Hamilton, Eugene L., and Long, Esmond R., M.D., Ph.D. A Review of Induction and Discharge Examinations for Tuberculosis in the Army.....	412
Hammon, W. McD., M.D., Dr.P.H. Comparative Epidemiology of Poliomyelitis in Certain California Cities.....	1545
Hargreaves, Margaret S., R.N., and Tabershaw, Irving R., M.D. Functions of Standing Orders for the Nurses in Industry.....	1430
Harris, Ad, and Mahoney, J. F., M.D. Cardiolipin and Purified Lecithin as Reagents in Syphilis Serology.....	997
Hathaway, John S., M.D., and Pond, M. Allen. An Epidemic of Mild Gastroenteritis of Unknown Etiology Presumably Spread by Contaminated Eating Utensils.....	1402
Hauser, George H., M.D., and King, William H. The Problem of Reconstituted Milk.....	1284
Hawaii, Control of Dengue in. Charles L. Wilbar, Jr., M.D.....	663
Hawaii through Health Surveys, Community Education in. Raymond George Nebelung, Dr.P.H. ....	875
Hazlett, T. Lyle, M.D., F.A.C.P. The Value of Industrial Hygiene.....	1302
Health administration. See: Criteria for the Allocation of Subsidy to Local Health Departments. John A. Kahl, M.D., M.P.H.....	199
Health Agencies, Merit System Administration in Official. Joseph W. Mountin, M.D., Bess A. Cheney, and Donald F. Simpson.....	23
Health and Social Statistics for the City. Halbert L. Dunn, M.D., Ph.D.....	739
Health Councils in Local Communities. Bleecker Marquette.....	959
See: The Health Officer and the Health Council. Editorial.....	1041
Letter to the Editor.....	1479
Health Department and Medical Care, The:	
Responsibility of the Health Officer in a Medical Care Program. F. W. Jackson, M.D..	253
Maryland Medical Care Program. Dean W. Roberts, M.D.....	259
Group Practice in Preventive Medicine. Dean A. Clark, M.D.....	264
Certain Trends. John B. Grant, M.D.....	269
Discussion: C.-E. A. Winslow, Dr.P.H.....	275
Health, Education and Security, A Cabinet Post of. Editorial.....	453
Health Education, Canada Sees New Horizons for. Lt. Col. C. W. Gilchrist, O.B.E., E.D..	1415
Health Education in Industry, The Nurse's Role in. Bethel J. McGrath, R.N.....	298
Health Education in Mexico. Manuel González Rivera, M.D.....	849
Health Education? What Is. A Symposium.....	641
Health Education? What Is. Editorial.....	744
Health Goals for Housing. C.-E. A. Winslow, Dr.P.H.....	653
Health Insurance. See The Nurse's Role in Health Education in Industry. Bethel J. McGrath, R.N.....	298
Health-minded leadership. See: Certain Trends. John B. Grant, M.D.....	269
Health Officer and the Health Council, The. Editorial.....	1041
Health Officer in a Medical Care Program, Responsibility of the. F. W. Jackson, M.D....	253
Health Officers-in-Training, A New Method of Selecting. Margaret W. Barnard, M.D., Dr.P.H., and William Brody.....	715
Health Officers, Regulation of Housing: Hints for. Charles S. Ascher, LL.B.....	507
Health plans. See: Vermont State Health Council. Credit Lines.....	213
Hearing Conservation Program, The California. Jessie M. Bierman, M.D., and Donald R. Caziare.....	407
Hepatitis and Homologous Serum Jaundice, Field Studies Relating to Immunity in Infectious. Ross L. Gauld, M.B., Dr.P.H.....	400
Hepatitis in Drinking Water, Inactivation of the Virus of Infectious. John R. Neeffe, M.D., Major James B. Baty, Sn.C., A.U.S., John G. Reinhold, Ph.D. and Joseph Stokes, Jr., M.D.....	365
Hirsch, Joseph. Alcohol Education—Its Needs and Challenges.....	1574
See: Alcoholism A Public Health Problem? Editorial.....	1595
Histoplasmosis in a Rural Community, Studies on. Byron J. Olson, M.D., Joseph A. Bell, M.D., and Chester W. Emmons, Ph.D.....	441

	Page
Hoge, Vane M., M.D. The Hospital as an Instrument in a Public Health Program. Hospital Relations—A Symposium.....	1519
Hormesis (Increase in Fatality Rate) by Penicillin, Demonstration of. W. A. Randall, Ph.D., C. W. Price, and H. Welch, Ph.D.....	421
Horton, R. J. M., M.D., Feemster, Roy F., M.D., Dr.P.H., and Ober, R. E., M.D. Congenital Defects in a Year of Epidemic Rubella.....	1328
Hospital as an Instrument in a Public Health Program, The. Hospital Relations—A Symposium. Vane M. Hoge, M.D.....	1519
Hospital Planning and Licensing Programs in Indiana, The. Hospital Relations—A Symposium. L. E. Burney, M.D., and Martha O'Malley, M.D.....	1533
Hospital Planning in New York State. Hospital Relations—A Symposium. John J. Bourke, M.D., M.P.H.....	1525
Hospital Relations—A Symposium:	
The Hospital as an Instrument in a Public Health Program. Vane M. Hoge, M.D.....	1519
Hospital Planning in New York State. John J. Bourke, M.D., M.P.H.....	1525
The Hospital Planning and Licensing Programs in Indiana. L. E. Burney, M.D., and Martha O'Malley, M.D.....	1533
Hospital Services in Saskatchewan. Frederick D. Mott, M.D.....	1539
Hospital Services in Saskatchewan. Hospital Relations—A Symposium. Frederick D. Mott, M.D. ....	1539
Hospital Statistics, Administrative and Research Uses of Routine Analyses of. Paul M. Densen, D.Sc.....	1421
Hospital Utilization, Age and Sex Variations in. (An Example of Morbidity Data Available from Blue Cross Records.) J. D. Colman, M.E.....	1307
House Document No. 380. See: Who is Un-American Now? Editorial.....	1592
Households, Morbidity Statistics through Periodic Surveys of. Theodore D. Woolsey....	1007
Housing Codes: Who Should Enforce Them, Building Codes and. Editorial.....	572
Housing Commission of the Health Organization of the League of Nations. See: Health Goals for Housing. C.-E. A. Winslow, Dr.P.H., Chairman.....	653
Housing, Health Goals for. C.-E. A. Winslow, Dr.P.H.....	653
Housing: Hints for Health Officers, Regulation of. Charles S. Ascher, LL.B.....	507
Housing, Need for Systematic Evaluation of Substandard. M. Allen Pond.....	967
Housing on Health, Studies of the Effect of the Provision of Good. Bleecker Marquette, Chairman, Joint Committee on Housing and Health of the American Public Health Association and the National Association of Housing Officials.....	303
Hubbard, John F., M.D., Williams, Charles L., Jr., M.D., M.P.H., and Bain, Katherine, M.D. The American Academy of Pediatrics Study of Child Health Services: Results to Date.....	1297
Huebner, Robert J., M.D. Report of an Outbreak of Q Fever at the National Institute of Health. II. Epidemiological Features.....	431
Humbert, Walter C., M.D., Tucker, C. B., M.D., Mosley, K. T., M.D., and Bishop, L. K., M.D. An Epidemic of an Acute Meningo-encephalitis in Giles County, Tennessee.....	564
Hunter, Charles A., Ph.D., and Ensign, Paul R., M.D., M.P.H. An Epidemic of Diarrhea in a New-Born Nursery Caused by Pseudomonas aeruginosa.....	1166
Hussemann, Dorothy L., Ph.D., and Tanner, F. W., Ph.D. Relation of Certain Cooking Procedures to Staptylococcus Food Poisoning.....	1407
Hypochlorite Products, A Method for Assessing the Sanitizing Efficiency of Quaternary Ammonium and. C. K. Johns, Ph.D.....	1322
I	
Ideal Intake of Calories and Specific Nutrients. Frederick J. Stare, M.D.....	515
Illinois, Full-time Health Service in. Editorial.....	209
Illuminator, A Darkfield Colony. Ronald M. Wood.....	205
Immunization. See: Diphtheria.	
Importance of a Standard Code for Tabulating Causes of Illness. Selwyn D. Collins, Ph.D.	1002
Importance of Controls in Public Health Field Studies, The. Editorial.....	72
Inactivation of Partially Purified Poliomyelitis Virus in Water by Chlorination. II. Serge G. Lensen, Ph.D., Morris Rhian, M.S., and Max R. Stebbins.....	869
Inactivation of the Virus of Infectious Hepatitis in Drinking Water. John R. Neeffe, M.D., Major James B. Baty, Sn.C., A.U.S., John G. Reinhold, Ph.D., and Joseph Stokes, Jr., M.D.....	365
Indiana. See: Hospital Relations.	
Induction and Discharge Examinations for Tuberculosis in the Army, A Review of. Esmond R. Long, M.D., and Eugene L. Hamilton.....	412
Industrial Hygiene?, Is Aviation Medicine. Brig. Gen. Eugen G. Reinartz, M.D.....	1130
Industrial Hygiene. See: Nuclear Energy.	
Industrial Hygiene Research, Next Steps in. Paul A. Neal, M.D.....	1104
Industrial Hygiene, The Union Contract and. Bernard S. Coleman.....	1449
Industrial Hygiene, The Value of. T. Lyle Hazlett, M.D., F.A.C.P.....	1302
Industrial Medicine, Administrative Problems of. Editorial.....	1337
Industrial Medicine, A Future for. Leonard J. Goldwater, M.D.....	1247
Industry, The Nurse's Role in Health Education in. Bethel J. McGrath, R.N.....	298



	Page
Infant Care, Experience and Lessons from Emergency Maternity and. Nathan Sinai, Dr.P.H. . . . .	1097
Infants Allegedly Due to Mechanical Suffocation, Sudden Deaths of. Jacob Werne, M.D., and Irene Garrow, M.D. . . . .	675
Infants' Wards by the Use of Triethylene Glycol Vapor, Control of Cross-Infections in. Clayton G. Looslie, M.D., Margaret H. D. Smith, M.D., Ross L. Gauld, M.D., Oswald H. Robertson, M.D., and Theodore T. Puck, Ph.D. . . . .	1385
Influenza in the Spring of 1947, Experience with Vaccination Against. Thomas Francis, Jr., M.D., Jonas E. Salk, M.D., and J. J. Quilligan, Jr., M.D. . . . .	1013
Influenza, The Present Status of Vaccination Against. Report of the Subcommittee on Evaluation of Administrative Practices, Committee on Administrative Practice. Thomas Francis, Jr., M.D., Chairman. . . . .	1109
Ingenious Yardstick for Measuring Health Status, An. Editorial. . . . .	747
International List of Causes of Death. See:	
Importance of a Standard Code for Tabulating Causes of Illness. . . . .	1002
Proposed Statistical Classification of Diseases, Injuries, and Causes of Death. Prepared by the United States Subcommittee. . . . .	1017
Investigations of the Swab Rise Technique for Examining Eating and Drinking Utensils. Leon Buchbinder, Ph.D., Theodore C. Buck, Jr., Percy M. Phelps, Raymond V. Stone, D.V.M., and Walter D. Tiedeman, M.C.E. . . . .	373
Investment in Personnel Administration, An. Credit Lines. . . . .	314
Irradiation of Classrooms on Spread of Measles in Large Rural Central Schools, Effect of Ultra-violet. James E. Perkins, M.D., Anne M. Bahlke, M.D., and Hilda Freeman Silverman . . . . .	529
Isotopes Available to the World, United States Makes. News from the Field. . . . .	1506
Isotopes. See: Nuclear Energy.	
Institutions Accredited by the American Public Health Association to Give the Degree of Master of Public Health (Diploma of Public Health in Canada) and the Degree of Doctor of Public Health for the Academic Year 1947-1948. . . . .	622
Ivey, John E., Jr., Ph.D. Regionalism as a Tool for Research and Social Engineering. . . . .	879

## J

Jackson, F. W., M.D. Responsibility of the Health Officer in a Medical Care Program. . . . .	253
Jameson, Sir Wilson. See: The Lasker Awards for 1947. . . . .	1612
Jameson, Wilson, K.C.B., M.D. The Place of Nutrition in a Public Health Program. . . . .	1371
Jaundice, Field Studies Relating to Immunity in Infectious Hepatitis and Homologous Serum. Ross L. Gauld, M.D., Dr.P.H. . . . .	400
Jean, Sally Lucas, R.N. What Is Health Education? . . . . .	647
Jellison, William L., Greenberg, Morris, M.D., and Pellitteri, Ottavio J. Rickettsialpox—A Newly Recognized Rickettsial Disease. III. Epidemiology. . . . .	860
Johns, C. K., Ph.D. A Method for Assessing the Sanitizing Efficiency of Quaternary Ammonium and Hypochlorite Products. . . . .	1322

## K

Kahl, John A., M.D., M.P.H. Criteria for the Allocation of Subsidy to Local Health Departments . . . . .	199
Kahn, Reuben L., Sc.D. Universal Serologic Reactivity with Lipid Antigens. . . . .	283
Kala-azar. See: UNRRA.	
Kandle, Roscoe P., M.D., M.P.H. The Evaluation of Local Health Work. . . . .	1143
Kendrick, P. L., Sc.D., Eldering, Grace, Sc.D., Dixon, M. K., and Misner, J. Mouse Protection Tests in the Study of Pertussis Vaccine: A Comparative Series Using the Intracerebral Route for Challenge. . . . .	803
King, William H., and Hauser, George H., M.D. The Problem of Reconstituted Milk. . . . .	1284
Kinnaman, Joseph H., M.D., M.P.H. Sheltered Care of the Aged (Problems of an Aging Population) . . . . .	163
Kitchen Garbage Grinder, The. Editorial. . . . .	573
Kleinfeld, Hyman J., Ph.D., and Buchbinder, Leon, Ph.D. Dishwashing Practice and Effectiveness (Swab-rinse Test) in a Large City as Revealed by a Survey of 1,000 Restaurants . . . . .	379
Klumpp, Theodore G., M.D. Care of the Aged and Chronically Ill (Problems of an Aging Population). . . . .	156
Knutson, John W., D.D.S., Dr.P.H. Simplified Procedure for the Collection of Basic Data for Dental Program Planning and Appraisal. . . . .	1439

## L

Laboratory and Clinical Evidence of Virulence of <i>C. diphtheriae</i> , The Correlation of. Martin Frohisher, Jr., Sc.D., Elizabeth I. Parsons, Sc.D., and Elaine Updyke, Sc.D. . . . .	543
--	-----

	Page
Laboratory Service, A National Nerve Center for Public Health. Editorial.....	745
Lasker Awards for 1946, The Recipients of.....	111
Lasker Awards for 1947, The.....	1612
Latin America, Training Health Workers for. Editorial.....	1340
Lecithin as Reagents in Syphilis Serology, Cardiolipin and Purified. Ad Harris and J. F. Mahoney, M.D.....	997
Lensen, Serge G., Ph.D., Rhian, Morris, M.S., and Stebbins, Max R. Inactivation of Partially Purified Poliomyelitis Virus in Water by Chlorination. II.....	869
León, Alberto P., M.D., M.P.H., and Sosa, José, Q.B.P. Allergy in Brucellosis.....	1033
Letters to the Editor:	
Aronson, Joseph D., M.D. Comment on "An Evaluation of the Use of BCG in the Prevention of Tuberculosis in Infants and Children." Milton I. Levine, M.D.....	1470
Lundy, Howard W., Dr.P.H. Compliments upon article "Health Councils in Local Communities" by Bleecker Marquette.....	1470
Levine, Milton I., M.D. An Evaluation of the Use of BCG in the Prevention of Tuberculosis in Infants and Children.....	1089
See: Letter to the Editor.....	1479
Lipid Antigens, Universal Serologic Reactivity with. Reuben L. Kahn, Sc.D.....	283
Local Communities, Health Councils in. Bleecker Marquette.....	959
See: The Health Officer and the Health Council. Editorial.....	1041
Local Health Departments, Criteria for the Allocation of Subsidy to. John A. Kahl, M.D., M.P.H. ....	199
Local Health Units, Proceedings of the National Conference on. Supplement to January, 1947, Journal.....	
Local Health Units, The Princeton Conference on.....	1502
Local Health Work, The Evaluation of. Roscoe P. Kandle, M.D., M.P.H.....	1143
Lombard, Herbert L., M.D., M.P.H. Preventive Aspects of Cancer Control (Problems of an Aging Population).....	170
Long, Esmond R., M.D., Ph.D., and Hamilton, Eugene L. A Review of Induction and Discharge Examinations for Tuberculosis in the Army.....	412
Loosli, Clayton C. Referee on Suppressive Measures for the Control of Dust, of the Standard Methods Committee. Dust and Its Control as a Means of Disinfection of Air.....	353
See: The Control of Air-borne Infections. Editorial.....	450
Loosli, Clayton C., M.D., Smith, Margaret H. D., M.D., Gauld, Ross L., M.D., Robertson, Oswald H., M.D., and Puck, Theodore T., Ph.D. Control of Cross-Infections in Infants' Wards by the Use of Triethylene Glycol Vapor.....	1385
Loudoun County, Va. See: Histoplasmosis.....	441

## M

Machine Dishwashing, Critical Study of. W. L. Mallmann, Ph.D., Paul DeKoning, and Leo Zalkowski.....	390
Mackintosh, Jean M., M.D., D.P.H., D.P.A. Maternity and Child Welfare in a Large British City.....	499
Mahoney, J. F., M.D., and Harris, Ad. Cardiolipin and Purified Lecithin as Reagents in Syphilis Serology.....	997
Maier, F. J., B.S.M.E., B.S.C.E. Methods of Removing Fluorides from Water.....	1559
Malaria. See: UNRRA.	
Mallmann, W. L., Ph.D., Chairman. Examination of Water and Sewage. Report of the Standard Methods Committee.....	759
Mallmann, W. L., Ph.D., DeKoning, Paul, and Zalkowski, Leo. Critical Study of Machine Dishwashing.....	390
Malta fever. See: Brucellosis.	
Manitoba health plan. See: Responsibility of the Health Officer in a Medical Care Program. F. W. Jackson, M.D.....	253
Marquette, Bleecker, Chairman, Joint Committee on Housing and Health of the American Public Health Association and the National Association of Housing Officials. Studies of the Effect of the Provision of Good Housing on Health.....	303
Marquette, Bleecker. Health Councils in Local Communities.....	959
See: The Health Officer and the Health Council. Editorial.....	1041
See: Letter to the Editor.....	1479
Marquette, Bleecker. What Is Health Education?.....	648
Martin, Ethel A., Chairman. Report of the Committee on Milk and Dairy Products. Food Values of Dairy Products as Affected by Methods in Handling in Production, Distribution, and Use. Riboflavin, Thiamin, Vitamin A.....	1113
Maryland Medical Care Program (The Health Department and Medical Care). Dean W. Roberts, M.D.....	259
Massachusetts. See: Congenital Defects in a Year of Epidemic Rubella. R. E. Ober, M.D., R. J. M. Horton, M.D., and Roy F. Feemster, M.D., Dr.P.H.....	1322
Mastitis, Penicillin in the Treatment of Infectious Bovine. C. S. Bryan, Ph.D., D.V.M.....	1147
Maternal Mortality, The Victory Over. Editorial.....	1476

	Page
Maternity and Child Welfare in a Large British City. Jean M. Mackintosh, M.D., D.P.H., D.P.A. . . . .	499
Maternity and Infant Care, Experience and Lessons from Emergency. Nathan Sinai, Dr.P.H. . . . .	1097
McCay, C. M., Ph.D. Effect of Restricted Feeding upon Aging and Chronic Diseases in Rats and Dogs. . . . .	521
McFarlane, Vernon H., Ph.D., Spaulding, E. H., Ph.D., Chemerda, Cecilia, and Solowey, Mathilde, Ph.D. Microbiology of Spray-dried Whole Egg. II. Incidence and Types of Salmonella. . . . .	971
McGrath, Bethel J., R.N. The Nurse's Role in Health Education in Industry. . . . .	298
Measles in Large Rural Central Schools, Effect of Ultra-violet Irradiation of Classrooms on Spread of. James E. Perkins, M.D., Anne M. Bahlke, M.D., and Hilda Freeman Silverman . . . . .	529
Measuring Health Status, An Ingenious Yardstick for. Editorial. . . . .	747
Meat Inspection, Mysteries of. Editorial. . . . .	1174
Medical Care Plans and Public Health Agencies, Rural Prepayment. Mark Ziegler, M.D., E. Richard Weinerman, M.D., and Milton I. Roemer, M.D., M.P.H. . . . .	1578
Medical Care. See: Planning for the Chronically Ill. . . . .	1236
Medical Care, The Health Department and:	
Responsibility of the Health Officer in a Medical Care Program. F. W. Jackson, M.D.	253
Maryland Medical Care Program. Dean W. Roberts, M.D. . . . .	259
Group Practice in Preventive Medicine. Dean A. Clark, M.D. . . . .	264
Certain Trends. John B. Grant, M.D. . . . .	269
Discussion: C.-E. A. Winslow, Dr.P.H. . . . .	275
Medical Social Worker in a County Health Department, The. Jess B. Spielholz, M.D., and Iva Val Brakel. . . . .	733
Mediterranean Theater. See: Hepatitis.	
Meningo-encephalitis in Giles County, Tennessee, An Epidemic of an Acute. Walter C. Humbert, M.D., C. B. Tucker, M.D., K. T. Mosley, M.D., and L. K. Bishop, M.D. . . . .	564
Mental diseases. See: Medical Care Programs.	
Mental hygiene. See: The Forgotten Mind. Editorial. . . . .	1170
Meredith, Howard V., Ph.D., and Stuart, Harold C., M.D. Use of Body Measurements in the School Health Program. Part III. . . . .	1435
Merit System Administration in Official Health Agencies. Joseph W. Mountin, M.D., Bess A. Cheney, and Donald F. Simpson. . . . .	23
Merit System. See:	
A Proposal for the Solution of the Recruitment Problem. Credit Lines. . . . .	91
Advertising in Recruitment. Richard Wm. Wallen, Ph.D. . . . .	212
Charles B. Frasher. An Investment in Personnel Administration. Credit Lines. . . . .	314
Method for Assessing the Sanitizing Efficiency of Quaternary Ammonium and Hypochlorite Products, A. C. K. Johns, Ph.D. . . . .	1322
Methods of Removing Fluorides from Water. F. J. Maier, B.S.M.E., B.S.C.E. . . . .	1559
Mexico, Health Education in. Manuel González Rivera, M.D. . . . .	849
Mickle, Friend Lee, Sc.D., Chairman. Coordinating Committee on Standard Methods. . . . .	752
Mickle, Friend Lee, Sc.D., Chairman. Examination of Frozen Desserts and Ingredients. Report of the Joint Standard Methods Committee on Frozen Desserts and Ingredients. . . . .	757
Microbiology of Spray-dried Whole Egg. II. Incidence and Types of Salmonella. Mathilde Solowey, Ph.D., Vernon H. McFarlane, Ph.D., E. H. Spaulding, Ph.D., and Cecilia Chemerda. . . . .	971
Military Establishments, Recent Studies on Disinfection of Air in. Report of the Committee on Sanitary Engineering, National Research Council, Division of Medical Sciences. Abel Wolman, Chairman. . . . .	189
Milk, The Problem of Reconstituted. George H. Hauser, M.D., and William H. King. . . . .	1284
Misner, J., Kendrick, P. L., Sc.D., Eldering, Grace, Sc.D., and Dixon, M. K. Mouse Protection Tests in the Study of Pertussis Vaccine: A Comparative Series Using the Intracerebral Route for Challenge. . . . .	803
Morbidity Data Available from Blue Cross Records, An Example of. Age and Sex Variations in Hospital Utilization. J. D. Colman, M.E. . . . .	1307
Morbidity Statistics through Periodic Sample Surveys of Households. Theodore D. Woolsey . . . . .	
Morgan, Lucy S., Ph.D. What Is Health Education? . . . . .	1007
Mosley, K. T., M.D., Bishop, L. K., M.D., Humbert, Walter C., M.D., and Tucker, C. B., M.D. An Epidemic of an Acute Meningo-encephalitis in Giles County, Tennessee. . . . .	564
Mott, Frederick D., M.D. Hospital Services in Saskatchewan. Hospital Relations—A Symposium . . . . .	1539
Mountin, Joseph W., M.D., Cheney, Bess A., and Simpson, Donald F. Merit System Administration in Official Health Agencies. . . . .	23
Mountin, Joseph W., M.D., and Flook, Evelyn. Program Audit—A Device for Reflecting Public Health Performance. . . . .	
Mouse Protection Tests in the Study of Pertussis Vaccine: A Comparative Series Using the Intracerebral Route for Challenge. P. L. Kendrick, Sc.D., Grace Eldering, Sc.D., M. K. Dixon, and J. Misner. . . . .	803

	Page
Muench, Hugo, M.D., Dr.P.H. Statistics in the Planning and Evaluation of Health Procedures . . . . .	1273
Mumps. See: Hepatitis.	
Municipal Public Health Engineering. Data on Current and Proposed Local Sanitation Division. Report of the Committee on Municipal Public Health Engineering. Leonard M. Board, Chairman. . . . .	901
Mustard, Harry S., M.D. The Stems and Roots of Public Health Practice. . . . .	1513
Mysteries of Meat Inspection. Editorial. . . . .	1174

## N

National Association for the Prevention of Tuberculosis of Great Britain. See: British Conference on Tuberculosis. . . . .	514
National Conference on Local Health Units. Proceedings of. Supplement to January, 1947, Journal.	
National Health Service Act. See: Birmingham, England.	
National Heart Disease Institute, Proposed. . . . .	982
National Institute of Health, Report of an Outbreak of Q Fever at the. II. Epidemiological Features. Robert J. Huebner, M.D. . . . .	431
National Nerve Center for Public Health Laboratory Service, A. Editorial. . . . .	745
Neal, Paul A., M.D. Next Steps in Industrial Hygiene Research. . . . .	1104
Nebelung, Raymond George, Dr.P.H. Community Education in Hawaii through Health Surveys . . . . .	875
Need for Systematic Evaluation of Substandard Housing. M. Allen Pond. . . . .	967
Neebe, John R., M.D., Eaty, James B., Major, Sn.C., A.I.S., Reinhold, John G., Ph.D., and Stokes, Joseph, Jr., M.D. Inactivation of the Virus of Infectious Hepatitis in Drinking Water . . . . .	865
New Method of Selecting Health Officers-in-Training, A. Margaret W. Barnard, M.D., Dr.P.H., and William Brody. . . . .	715

	Page		Page
News from the Field (and Fillers) . . . . .	127, 239, 338, 487, 629, 794, 950, 1077, 1233, 1360, 1502, 1634	News from the Field (and Fillers)—Cont.	
Additions to Hospital Facilities in New York City. . . . .	130	of Commission on Hospital Care Made a Permanent Department of. . . . .	131
Advanced Course in Obstetric Nursing. . . . .	342	American Institute of Nutrition. See: Nutrition Awards. . . . .	1239
Advertising Council's Tuberculosis Program . . . . .	635	American Medical Directory, 1948. . . . .	1544
Alabama State Health Officer, Dr. Gill Appointed . . . . .	343	American Museum of Health. . . . .	810
Alcoholism in the News. . . . .	492	American Pharmaceutical Manufacturers' Association Award to Mayo Foundation . . . . .	128
Allocating State Funds to Local Health Departments . . . . .	487	American Red Cross National Blood Program . . . . .	1636
Altland, John K., M.D., M.S.P.H., Appointed Acting Commissioner, Michigan Department of Health. . . . .	1639	Foreign Group to Study American Blood Program. . . . .	1239
A.M.A. See: American Medical Directory, 1948. . . . .	1544	Poliomyelitis Staff Training Conferences . . . . .	488
American Association for the Advancement of Science. See: Antibiotic Symposium . . . . .	1558	American Water Works Association (Officers Elected). . . . .	492
American Association of University Women, The. See: Fellowships for Women . . . . .	1364	Antibiotic Symposium. . . . .	1558
American Cancer Society, Charles S. Cameron, M.D., Heads. . . . .	1363	Antimalarial Drug Survey Published. . . . .	1640
American College of Physicians, Clinical Fellowships of. . . . .	493	Apprenticeship Training in Public Health Nursing. . . . .	528
American Dental Association Council Rules on Bone Meal and Fluorine Products . . . . .	727	Arizona Public Health Association. . . . .	1241
American Foundation of High Blood Pressure. See: New Foundation for the Study of Blood Pressure Announced . . . . .	243	Arkansas, Industrial Hygiene Division in . . . . .	1236
American Friends Service Committee. See: Finland Needs Technical Books. . . . .	1532	Arkansas, Mental Hygiene Division in. . . . .	489
American Heart Association Election. . . . .	1236	Army Forms a Venereal Disease Control Council, The. . . . .	629
American Hospital Association. . . . .	1639	Army Medical Center, New. . . . .	1367
Institutes in Hospital Administration . . . . .	244	Arsenic in Soy Sauce. . . . .	1321
"Trustee" Begins Publication. . . . .	1364	Arteriosclerosis, New Light on. . . . .	795
American Hospital Association, Work		Associated Medical Care Plans. . . . .	243
		Atomic Bomb Award, Social Aspects of Atomic Energy Commission, Physicians Advise . . . . .	630
		Atomic Radiations Unit Formed. . . . .	1507
		Attention: Sanitary Corps Officers. . . . .	1365
		Austen Riggs Foundation. . . . .	839
		Award to Psychiatric Aide of the Year . . . . .	796
		Baumgartner, Leona, M.D., Completes Ten Years of Child Health Work. . . . .	868
		BCG Vaccine, Tuberculosis Research Center to Supply. . . . .	636
			1508

News from the Field (and Fillers)—Cont.	Page	News from the Field (and Fillers)—Cont.	Page
Bierring, Walter L., M.D. See: Public Health Officers Honored.....	1084	Cerebral Palsy Commission Reports, New York State.....	1365
Biggs Memorial Lecture by Haven Emerson .....	342	Chesley, Albert J., M.D., Social Hygiene Life Membership to.....	1081
Birth Registration, Louisiana Experiment in.....	240	Chest X-rays for United Nations Secretariat .....	241
Blood Pressure Announced, New Foundation for the Study of.....	243	Chest X-Ray Program in New Orleans, Chicago, University of. See: Advanced Course in Obstetric Nursing.....	342
Blood Processing Laboratory, Massachusetts Has New.....	629	Children's Bureau Grant at Harvard School of Public Health.....	1366
Blood Program, American Red Cross..	1636	Chinese Public Health Association Is Established .....	1032
Blood Program, Foreign Group to Study American .....	1239	Chlorine, Chloramine, and Chlorine Dioxide .....	1638
Bloomfield, John J., to Bolivia.....	347	Circulatory Diseases, Proposed Federal Program for.....	754
Bolivian Public Health Association, New .....	634	Circulatory Diseases, Proposed Federal Program on.....	951
Bone Meal and Fluorine Products, American Dental Association Council Rules on.....	727	Clinical Fellowships of American College of Physicians.....	493
Boston, "Eye-Bank" for.....	1238	College Health Conference in May....	489
Bread and Flour Enrichment, Where We Stand on.....	406	Colorado Public Health Association....	1081
Breed, Robert S., Ph.D., Is Honored for Studies in Dairy and Cheese Field..	1006	Colorado State Laboratory Expands Services .....	1635
British Conference on Tuberculosis....	514	Columbiana County, Ohio, Implements Public Health Survey.....	130
British Health Congress.....	1237	Columbia School of Public Health, Advanced Course in Industrial Hygiene Nursing at.....	794
British Representation at the 75th Annual Meeting.....	506	Columbia University, Expanded Teaching Program in Industrial Hygiene at Commission on Hospital Care Made a Permanent Department of American Hospital Association, Work of.....	131
British Society of Medical Officers of Health, Honorary Fellowships Presented in.....	1637	Commodity Standards, National Bureau of Standards Establishes Division of Commonwealth Fund Appoints New Director .....	952
Brucellosis Center Established at Finlay Institute .....	1242	Communicable Disease Precautions, San Francisco .....	1509
Burritt, Bailey B. as Executive Director, National Health Council Names.....	341	Confidential System for Filing True Cause of Death.....	188
Cabinet Status for Public Health, U. S. Senate Hearings on Proposed.....	632	Connecticut Local Health Officers Back Health District Plan.....	129
Caceres, Luis Espinosa y G., M.D., Appointed as Cuba's Director General of Public Health.....	1233	Connecticut's Housing Seminar.....	1079
California Hearing Conservation Program, The. See: Reprints.....	1082	Connecticut Public Health Association..	1081
California, Office of Recruitment and Training in.....	1240	Connecticut, State Aid for Local Health Districts in.....	1079
Cameron, Charles S., M.D., Heads American Cancer Society.....	1363	Connolly, Mary, Prentiss Award to....	130
Canada Created, National Cancer Institute of.....	1070	Cook County Hospital. See: Specialist Service to Outlying Territories.....	1363
Cancer and Heart Programs, Women's Clubs Support.....	1460	Coöperation in Training Public Health Nurses .....	244
Cancer Award Established in Wisconsin, Stovall.....	1234	Corn Products, Enrichment of.....	1240
Cancer Control, Maryland Division of..	1239	Cuba Appoints New Director General of Health .....	1233
Cancer Detection Clinics, Growth of...	344	Cutter Lecture, Haven Emerson To Deliver .....	1414
Cancer Fund, Ten Years of Jane Coffin Childs .....	1082	Dairy and Cheese Field, Robert S. Breed, Ph.D., Is Honored for Studies in .....	1006
Cancer Institute for Public Health Nurses .....	1241	Dana Medal to Frederick H. Berhoef, M.D., Annual.....	1638
Cancer Institute of Canada Created, National .....	1079	Darby, William J., M.D. See: Nutrition Awards .....	1230
Cancer Registry, Kansas Establishes a Cancer. See: Atomic Energy, Isotopes.	1083	Davis, Burnet M., M.D. Note on the Health Congress of the Royal Sanitary Institute .....	1360
Cancer. See: United States Makes Isotopes Available to the World.....	1506	Dental Health in Massachusetts, Division of.....	241
Carbon Monoxide. See: Ventilation of Garages and Plants.....	1363	Dentistry in New York City Health Department, Bureau of.....	1363
Care Packages, Two New.....	636		
Cattaraugus County, N. Y. See: Coöperation in Training Public Health Nurses .....	244		
Cause of Death, Confidential System for Filing True.....	188		

News from the Field (and Fillers)—Cont.	Page	News from the Field (and Fillers)—Cont.	Page
Dermatitis, Prevention of.....	1364	Forest Glen, Md. See: New Army	
Devastated Library Needs.....	835	Medical Center.....	1367
Devine, Thomas. See: New Editor of		Fourth Interim Health Commission	
Survey Midmonthly.....	1635	Meets in Geneva.....	1316
Disease Outbreaks Through Water,		Fourth International Congresses on	
Milk, and other Foods.....	425	Tropical Medicine and Malaria.....	1640
Dogs To Be Vaccinated, New York		Frazier, Frances M., R.N. See:	
City . . . . .	241	Public Health Nurse on Staff of	
Eliot, Martha M., M.D., To Serve Inter-		Harvard School of Public Health....	1081
national Children's Emergency Fund	797	French Public Health Honor to Dr.	
El Paso, New Medical Center for.....	796	Hennessy. . . . .	634
Emerson, Haven, M.D.		Fuller, George W., Award to Mac H.	
To Deliver Cutter Lecture.....	1414	McCrady. . . . .	1083
Biggs Memorial Lecture by.....	342	Garages and Plants, Ventilation of....	1363
Emerson, Kendall, M.D., Resigns from		Garbage and Refuse, Inservice Training	
National Tuberculosis Association... 1634		Course in the Collection and Dis-	
Engineer or a Sanitarian? What Is a		posal of.....	1362
Public Health.....	1290	Geiger, J. C., M.D. See: San Fran-	
Engineering Students Course.....	342	cisco Communicable Disease Precau-	
Environmental Sanitation Problems,		tions. . . . .	1509
Need for Federal Research Grants to		Geneva, Fourth Interim Health Com-	
Study . . . . .	848	mission Meets in.....	1316
Eye-Bank " for Boston.....	1238	Georgia Public Health Association....	1080
"Eye Bank" Set up in New Orleans.. 1366		Georgia School of Technology, Short	
"Facing Tomorrow" See: Red Cross		Course in Industrial Hygiene at....	1230
Services to Veterans.....	128	Georgia School of Technology, The.	
Faculty Changes at Harvard School of		See: Engineering Students Course... 342	
Public Health.....	245	Gill, Gordon D., M.B., D.P.H., Ap-	
"Faculty on Wheels" To Austria and		pointed Alabama State Health Officer.. 343	
Hungary, WHO Sponsors.....	954	Gillespie, C. G., Retires.....	490
Fairley, Neil Hamilton, M.D., Richard		Glaucoma. See: National Society for	
Pearson Strong Award to London's.. 128		the Prevention of Blindness.....	490
Family and Community Living.....	720	Godfrey, Edward S., M.D. Retires as	
Federal Civil Service Examinations for		New York State Commissioner of	
Statisticians. . . . .	263	Health. . . . .	951
Federal Employee Health Program.... 338		Grant for Multiple Sclerosis Research.. 1242	
Federal Grants for Mental Health		Grants for Postgraduate Schools of	
Research. . . . .	1366	Public Health, Proposal to Provide.. 1240	
Federal Hospital Council and Advisory		Growth of Cancer Detection Clinics.... 344	
Committee. . . . .	246	Hale, J. Elliot. See: Maine's New	
Federal Hospital Council, New Mem-		Section of Industrial Health.....	1242
bers of the.....	1636	Haller, John F., M.D. See: Chlorine,	
Federal Program for Circulatory Dis-		Chloramine and Chlorine Dioxide.... 1638	
eases, Proposed.....	754	Hansen Medal to Professor Waksman.. 1508	
Federal Research Grants to Study En-		Harvard—Massachusetts Institute of	
vironmental Sanitation Problems,		Technology School of Public Health	
Need for.....	848	Graduates, Master of Public Health	
Federal Surplus Property, Purchase of 537		Degrees to.....	1082
Fellowships, Field Training in Michigan 796		Harvard School of Public Health,	
Fellowships for Women.....	1364	Children's Bureau Grant at.....	1366
Fellowships, WHO Public Health..... 1507		Harvard School of Public Health,	
Ferree, John W., M.D., to National		Faculty Changes at.....	245
Health Council.....	953	Harvard School of Public Health,	
Field Training Fellowships in Michigan 796		Public Health Nurse on Staff of..... 1081	
Film on Peckham Experiment.....	1638	Hawaii Public Health Association.... 1241	
Films and Film Strips on Heart Disease 339		Health and Fitness, Work Shop in	
Films, Healthful Living in.....	240	Education for.....	440
Finland Needs Technical Books..... 1532		Health Council of Greater New York	
Finlay Institute, Havana, Cuba, Bru-		Completes Its First Year.....	953
cellosis Center Established at..... 1242		Health District Plan, Connecticut Local	
First Post-war New England Health		Health Officers Back.....	129
Institute. . . . .	491	Health, Education and Security, U. S.	
Fisher, Irving, Professor of Yale Dies.. 798		Congress Considers Department of.... 339	
Florida Public Health Association, Inc.. 129		Healthful Living in Films.....	240
Flour Enrichment, Where we Stand on		Health Unit Law, West Virginia	
Bread and.....	406	Strengthens Permissive.....	796
Flourine Products, American Dental		Hearing, United States Army Opens	
Association Council Rules on Bone		Rehabilitation Center for Hard of.... 132	
Meal and.....	727	Heart Disease, Films and Film Strips.. 339	
Folks, Homer Retires.....	493	Heart Programs, Women's Clubs Sup-	
Foodhandler Examination, Illinois De-		port Cancer and.....	1460
clares Policy On.....	489	Helmholz, Henry F., M.D., Honored... 1508	
Foreign Group to Study American		Hennessy, Harold R., M.D., C.P.H.,	
Blood Program.....	1230	French Public Health Honor to.... 634	

News from the Field (and Fillers)—Cont.	Page	News from the Field (and Fillers)—Cont.	Page
Hill, Hibbert Winslow, M.D., D.P.H., Death of.....	1237	International Children's Emergency Fund, Martha M. Eliot, M.D., To Serve.....	797
Hilleboe, Herman E., M.D., New York State Health Commissioner.....	1077	International Congress of Nurses.....	1079
Home Accidents, Kansas City Health Department Interest in Prevention of.....	1236	International Exchange of Public Health Specialists Through United Nations..	343
Honorary Fellowships Presented in British Society of Medical Officers of Health.....	1637	International Pediatricians to Meet in United States in July.....	701
Hospital Administration, University of Minnesota Adds Course in.....	345	International Tropical Medicine Con- gress to Meet in Washington, May, 1948.....	1306
Hospital and Institutional Services in Indiana Division of.....	241	International Union against the Venereal Diseases.....	1636
Hospital Construction Act. See: Fed- eral Hospital Council and Advisory Committee.....	246	International Union for Combating Venereal Diseases.....	243
Hospital Construction Priorities, Neg- lected Areas Will Have.....	347	Interstate Milk Shippers, Sanitary Ratings of.....	338
Housing Seminar.....	1079	Iowa, University of. See: University Courses in Hospital Administration..	794
Houston, Tex., Milk Pasteurization Ordinance in.....	247	Isotopes Available to the World, United States Makes.....	1506
Human Relations Quarterly.....	954	Jane Addams Medal, Florence Rena Sabin, M.D., First Winner of.....	952
Idaho Public Health Association.....	1080	Jane Coffin Childs Memorial Fund, Ten Years of.....	1082
Illinois:		Journal of the Inter-American Associa- tion of Sanitary Engineers.....	1367
Counties Vote County Health Depart- ments, Seventeen.....	130	Kanawha Valley Medical Center. See: West Virginia Rapid Treatment Center Transferred to State Health Department.....	1083
Declares Policy on Foodhandler Examinations.....	489	Kansas City Health Department Interest in Prevention of Home Accidents.....	1236
New City-County Health Depart- ment in.....	1083	Kansas Establishes A Cancer Registry..	1083
Public Health Association.....	1081	Kansas Public Health Association Annual Meeting To Be May 27-28....	635
Indiana:		Kansas Public Health Association Elects New Officers.....	1081
Division of Hospital and Institutional Services in.....	241	Kessler, Henry H., M.D., Heads Na- tional Council on Rehabilitation....	1365
Legislature Increases Health Appro- priations.....	797	Lansing-Ingham, Michigan, County Health Unit.....	1365
Public Health Association.....	630	Lanza, Anthony J., M.D., and Meleney, Henry E., M.D., Direct Institute of Industrial and Social Medicine.....	1242
Tackles Rural Doctor Shortages.....	487	Larimore, Granville W., Captain, M.C., A.U.S., Legion of Merit Awarded to..	1235
Industrial Health Consultant Service..	1242	Law 658. See: Federal Employee Health Program.....	338
Industrial Health, Maine's New Section of.....	1242	Lectures to the Laity.....	1640
Industrial Hygiene at Columbia Uni- versity, Expanded Teaching Program in.....	488	Lederle Renews Tick Fever Grant.....	900
Industrial Hygiene at Georgia School of Technology, Short Course In.....	1239	Legion of Merit Awarded to Granville W. Larimore, Captain, M.C., A.U.S....	1235
Industrial Hygiene Division in Arkansas.....	1236	Lenroot, Katharine, National Institute of Social Sciences Medal to.....	955
Industrial Hygiene in Portland, Ore., High School.....	1238	Library Needs, Devastated.....	835
Industrial Hygiene Nursing at Colum- bia School of Public Health, Advanced Course in.....	794	Lincoln and Lancaster County, Nebraska, Join Forces.....	1238
Industrial Medicine Fellowship at Pittsburgh.....	347	Listek, S. S. See: Chlorine, Chloram- mine, and Chlorine Dioxide.....	1638
Infant Mortality Rate in 1945, Low....	339	Local Health Departments, Allocating State Funds to.....	487
In-Service Training Course for Water Works Personnel.....	490	Local Health Service in Michigan, More.....	487
In-Service Training in Action.....	1237	Local Health Services Meet, State Directors of.....	953
In-Service Training Course in the Col- lection and Disposal of Garbage and Refuse.....	1362	Local Health Units, National Health Council Resolution.....	629
Institute of Industrial and Social Medi- cine, Anthony J. Lanza, M.D., and Henry E. Meleney, M.D., Direct.....	1242	Local Health Units, The Princeton Conference on.....	1502
Institutes in Hospital Administration..	244	Louisiana Experiment in Birth Regis- tration.....	240
Inter-American Association of Sanitary Engineering, Formation of.....	955	Low Infant Mortality Rate in 1945....	339
Inter-American Association of Sanitary Engineers, Journal of the.....	1367		
International Association of Milk Sanitarians.....	129		

News from the Field (and Fillers)—Cont.	Page	News from the Field (and Fillers)—Cont.	Page
Lyall, Dennis L. Correction.....	1084	Milk-Borne Disease Outbreaks—1923-1945, Summary of.....	797
Maine, Four New State District Health Officers in.....	128	Milk Pasteurization Ordinance in Houston.....	247
Maine's New Section of Industrial Health.....	1212	Miller, James Alexander, M.D., New York Academy Medal to.....	797
Malaria. See: Antimalarial Drug Survey Published.....	1640	Milwaukee's Hall of Fame.....	1112
Malaria, Fourth International Congresses on Tropical Medicine and....	1640	Minnesota Public Health Conference Organized.....	630
Markle Foundation's Post-Fellowship Grants.....	1638	Minnesota, University of, Adds Course in Hospital Administration.....	345
Maryland Division of Cancer Control..	1239	Missouri Public Health Association....	1080
Massachusetts Central Health Council Proposes State Health Survey.....	246	Mosquito control. See: Research Request.....	339
Massachusetts Department of Public Health. See: In-Service Training in Action.....	1237	Multiple Sclerosis Research, Grant for..	1242
Massachusetts, Division of Dental Health in.....	241	Municipal Construction Plans Emphasize Sanitation Projects.....	634
Massachusetts Has New Blood Processing Laboratory.....	629	Museum of Health, American.....	810
Massachusetts Institute of Technology School of Public Health Graduates, Master of Public Health Degrees to Harvard.....	1082	Mustard, Harry Stoll, M.D., Becomes New York City Commissioner of Health.....	1634
Massachusetts Public Health Conference.....	1507	National Bureau of Standards Establishes Division of Commodity Standards.....	1363
Master of Public Health Degrees to Harvard—Massachusetts Institute of Technology School of Public Health Graduates.....	1082	National Cancer Institute, Leonard A. Scheele, M.D. to Head.....	1233
Maynard, Leonard A., Ph.D. See: Nutrition Awards.....	1239	National Cancer Institute of Canada Created.....	1079
Mayo Foundation, American Pharmaceutical Manufacturers' Award to....	128	National Conference on Health in Colleges. See: College Health Conference in May.....	489
McCrady, Mac H., George W. Fuller Award to.....	1083	National Health Council, John W. Ferree, M.D. to.....	953
McGavran, Edward G., M.D., M.P.H., Appointed Dean at University of North Carolina.....	634	National Health Council Names Bailey B. Burritt as Executive Director.....	341
McGill to Grant Degree in Tropical Medicine.....	1639	National Health Council Resolution for Local Health Units.....	629
McGraw-Hill Nursing Book Prizes Announced.....	346	National Hearing Week.....	1301
Mead Johnson Vitamin A Fund.....	131	National Institute of Health, Research Grant Division of the. See: Sewage Research.....	1505
Medical and Public Health Work, Nuclear Research for.....	795	National Institute of Social Sciences Medal to Katharine Lenroot.....	955
Medical Association, World.....	340	National Malaria Society.....	129
Medical Bibliographies Available.....	888	National Mental Health Foundation, The. See: Mental Health Radio Programs.....	344
Medical Care Plans, Associated.....	243	National Negro Health Week.....	339
Medical Center for El Paso, New.....	796	National Nursing Council Studies Nursing Jobs.....	635
Medical Relief, 1947 Drive for Worldwide.....	430	National Research Council. See: Enrichment of Corn Products.....	1240
Meleney, Henry E., M.D., and Lanza, Anthony J., M.D., Direct Institute of Industrial and Social Medicine.....	1242	National Social Welfare Assembly....	340
Memorial Laboratory Dedicated at National Institute of Health. See: Research Plans Announced by U. S. Public Health Service.....	239	National Society for the Prevention of Blindness.....	490
Mental Health Radio Programs.....	344	National Tuberculosis Association to Have New Managing Director.....	1634
Mental Health Research, Federal Grants for.....	1366	Naval Reserve Medical Officers, Opportunities for.....	1508
Mental Hygiene Division in Arkansas..	489	Nebraska, Join Forces, Lincoln and Lancaster County.....	1238
Merck Awards for Training Scientists..	1235	Need for Federal Research Grants to Study Environmental Sanitation Problems.....	848
Michigan Department of Health, John K. Altand, M.D., M.S.P.H. Appointed Acting Commissioner.....	1639	Neglected Areas will have Hospital Construction Priorities.....	347
Michigan, More Local Health Service in.....	487	Negro Health Week, National.....	339
Michigan Public Health Association....	246	Nelbach, George J., Retires.....	1638
Michigan, University of, Inservice Training Course in the Collection and Disposal of Garbage and Refuse....	1362	New England Health Institute.....	636
		New England Health Institute, First Post-war.....	491
		New England Health Institute Resumes.....	1233



News from the Field (and Fillers)—Cont.	Page	News from the Field (and Fillers)—Cont.	Page
New Jersey, A Bill to Authorize County Health Departments in.....	340	Nursing, Apprenticeship Training in Public Health.....	528
New Jersey's State Health Department Reorganization. ....	1078	Nursing Book Prizes Announced, McGraw-Hill. ....	346
New Mexico Public Health Association..	953	Nursing Jobs, National Nursing Council Studies.....	635
New Nutrition Department at Northwestern University.....	1509	Nursing School Admissions Below 1936 Level, 1946.....	245
New Orleans, Chest X-Ray Program in. ....	634	Nutrition Awards.....	1239
New Orleans, "Eye Bank" Set up in..	1366	Obstetric Nursing, Advanced Course in.....	342
New York Academy of Medicine, Public Health Features of Centennial.....	342	Occupational Dermatitis. See: Prevention of Dermatitis.....	1364
New York Academy of Medicine. See: Lectures to the Laity.....	1640	Occupational Disease Compensation Laws, 1947.....	1235
New York Academy Medal to James Alexander Miller, M.D.....	797	Office of Recruitment and Training in California. ....	1240
New York City, Additions to Hospital Facilities in.....	130	Ohio Director of Health. John D. Porterfield, M.D., M.P.H.....	1234
New York City Commissioner of Health, Harry Stoll Mustard, M.D. Becomes..	1634	Ordinance and Code Regulating Eating and Drinking Establishments. See: Restaurant Sanitation Ordinance....	128
New York City Dogs to be Vaccinated..	241	Oregon, Portland, Industrial Hygiene in High School.....	1238
New York City Health Department, Bureau of Dentistry in.....	1363	Palmer, George T., Dr.P.H. See: Office of Recruitment and Training in California. ....	1240
New York City, 1946 a Record Health Year in.....	204	Pan American Sanitary Bureau. Fred L. Soper, M.D., Heads.....	794
New York City, Public Health Association of.....	1080	Parasitic Diseases, Courses in the Laboratory Diagnosis of.....	1637
New York Practical Nurse Law Challenged. ....	242	Parran, Thomas, M.D. See: Public Health Officers Honored.....	1084
New York State Cerebral Palsy Commission Reports.....	1365	Passano Foundation Award to Dr. Waksman. ....	818
New York State Health Commissioner, Herman E. Hilleboe.....	1077	Patent Free?, Need a.....	1234
New York State. See: What Is a Public Health Engineer or a Sanitarian? . . . . .	1290	Pay Increase for Nurses.....	489
New York State Youth Commission. See: Youth Service News.....	1084	Peckham Experiment, Film on.....	1638
New Zealand and Syria. See: Two More Nations Ratify World Health Charter. ....	340	Pediatricians to Meet in United States in July, International.....	761
1917 Occupational Disease Compensation Laws. ....	1235	Pennsylvania, Public Health Interest in.....	751
1946 a Record Health Year in New York City. ....	204	Pennsylvania State Secretary of Health, Dr. N. W. Vaux Appointed.....	343
1946 in Public Health, The Year.....	258	Perkins, James E., M.D., Dr.P.H. See: National Tuberculosis Association to Have New Managing Director.....	1634
1946 Nursing School Admissions Below 1936 Level.....	245	Personals....133, 247, 347, 494, 636, 798, 956, 1084, 1243, 1367, 1510, 1640	
Non-Immigrant Entry Authorized for Doctors. ....	242	Pharmacy Section in Hospital Division, U.S.P.H.S. ....	1366
North Carolina, Degree Changes at....	1506	Physicians Advise Atomic Energy Commission. ....	1507
North Carolina Hospital Plan Approved. ....	1639	Pittsburgh, Industrial Medicine Fellowship at.....	347
North Carolina Medical Care Commission. ....	631	Plotz, Harry, M.D., Typhus Expert, Dies. ....	344
North Carolina, University of.....	926	Poison Ivy. See: Prevention of Dermatitis. ....	1364
North Dakota Public Health Association.....	1080	Poliomyelitis Staff Training Conferences. ....	488
Northwestern University, New Nutrition Department at.....	1509	Porterfield, John D., M.D., M.P.H., Appointed Ohio Director of Health.....	1234
Norton Medical Award Changed.....	845	Postgraduate Schools of Public Health, Proposal to Provide Grants for.....	1240
Nuclear Research for Medical and Public Health Work.....	795	Prentiss Award to Mary Connolly.....	130
Nuclear Research Program. See: Research Plans Announced by U. S. Public Health Service.....	239	President's Budget Message to the Congress of the United States. See: \$1,877,000,000 for Social Welfare, Health and Security Requested.....	340
Nurse Counseling and Placement Office..	343	President's 1947 Health Message, U. S..	1077
Nurse Law Challenged, New York Practical. ....	242	President Urges U. S. Participation in World Health Organization.....	631
Nurse Recruitment Program.....	630		
Nurses in Public Health.....	1082		
Nurses, International Congress of.....	1079		
Nurses, Pay Increase for.....	489		

News from the Field (and Fillers)—Cont.	Page
Princeton Conference on Local Health Units, The.....	1502
Progress in World-Wide Cooperation in Public Health.....	268
Proposed Federal Program for Circulatory Diseases.....	754
Proposed Federal Program on Circulatory Diseases.....	951
Proposed National Heart Disease Institute.....	982
Psychiatric Aide of the Year, Award to.....	868
Public Health Cooperation in Student Nurse Recruitment Program.....	743
Public Health Features of Centennial, New York Academy of Medicine.....	342
Public Health Interest in Pennsylvania.....	751
Public Health Nurse on Staff of Harvard School of Public Health.....	1081
Public Health Nursing Week.....	491
Public Health Officers Honored.....	1084
Puerto Rico Invites Public Health Visitors to Its February Meeting....	1518
Puerto Rico Public Health Association.....	491
Puerto Rico. See: Non-Immigrant Entry Authorized for Doctors.....	242
Purchase of Federal Surplus Property..	537
Radio in Public Health.....	359
Ragweed Control.....	127
Railroad Sanitation Gets Attention...	345
Rafschman, Dr. Ludwig, Named Head of United Nations Children's Emergency Fund.....	344
Rat Control, One Year of.....	1508
"Rat Controller." See: One Year of Rat Control.....	1508
Red Cross Services to Veterans.....	128
Reed, Walter, M.D., Bust in the Hall of Fame.....	1120
Rehabilitation, Henry H. Kessler Heads National Council on.....	1365
Reprints, The California Hearing Conservation Program, Jessie M. Bierman, M.D., and Donald R. Caziarc... 1082	
Research Plans Announced by U. S. Public Health Service.....	239
Research Request.....	339
Restaurant Sanitation Ordinance.....	128
Rheumatic Fever, Whitney Foundation to Study.....	1236
Rheumatic Heart Disease to be Studied in New York.....	1235
Rickards, Burt R., Retires.....	243
Routzahn, Mary Swain, Retirement of..	1236
Royal Sanitary Institute, Note on the Health Congress of the.....	1360
Royal Sanitary Institute. See: British Health Congress.....	1237
Rudolph, Myron P., Colonel, MC, AUS, Awarded Typhus Commission Medal.....	1234
Rural Doctor Shortage, Indiana Tackles.....	487
Russell Sage Foundation, Forty Years of the.....	563
Sabin, Florence R., M.D., Elected Honorary Fellow of the A.P.H.A....	1510
Sabin, Florence Rena, M.D., First Winner of Jane Addams Medal.....	952
San Francisco Communicable Disease Precautions.....	1509
Sanitary Corps Officers. Attention:...	830

News from the Field (and Fillers)—Cont.	Page
Sanitary Engineering, Formation of Inter-American Association of.....	955
Sanitary Engineering in South Carolina, Division of.....	241
Sanitary Ratings of Interstate Milk Shippers.....	338
Sayers, R. R., M.D., Loaned to United Mine Workers.....	1366
Scheele, Leonard A., M.D. to Head National Cancer Institute.....	1233
Seattle and King County Join Hands..	1637
Sewage Research.....	1505
Sheehan, Donal, M.D., See: Commonwealth Fund Appoints New Director..	952
Smith, Courtney, M.D., Dies in Airplane Accident.....	1082
Social Aspects Of Atomic Bomb Award..	630
Social Hygiene Life Membership to Albert J. Chesley, M.D.....	1081
Social Security, U. S. Senate Appoints Citizens' Advisory Council of.....	1506
Social Welfare Assembly, National....	340
Social Welfare, Health and Security Requested, \$1,877,000,000.....	340
Soper, Fred L., M.D., Heads Pan American Sanitary Bureau.....	794
South Carolina, Division of Sanitary Engineering in.....	241
Southern Branch Annual Meeting.....	952
Southern Branch, A.P.H.A., Announces New Meeting Plans.....	132
Soviet Union, U.S.S.R. Appoints Minister of Health for.....	632
Soy Sauce, Arsenic in.....	1321
Specialist Service to Outlying Territories.....	1363
State Aid for Local Health Districts in Connecticut.....	1079
State Directors of Local Health Services Meet.....	953
State Funds to Local Health Departments, Allocating.....	487
State Health Survey, Massachusetts Central Health Council Proposes....	246
Statisticians, Federal Civil Service Examinations for.....	263
Stayer, General Morrison C., Honored..	242
Stovall, William D., M.D. Cancer Award Established in Wisconsin.....	1234
Strong, Richard Pearson, Award to London's Dr. Fairley.....	128
Student Nurse Recruitment Program, Public Health Cooperation in.....	743
Subcommittee on Medical Care, Medical Bibliographies Available.....	888
Survey Midmonthly, New Editor of....	1635
Texas Public Health Association.....	488
Tompson, Louis Ryers, M.D., Retires..	242
Tick Fever Grant, Lederle Renews.....	900
Tompkins County (N. Y.) Appoints Board of Health.....	1083
Torquay, Devon, England. Note on the Health Congress of the Royal Sanitary Institute.....	1360
Training Public Health Nurses, Cooperation in.....	244
Tropical Medicine and Malaria, Fourth International Congresses on.....	1640
Tropical Medicine and Public Health for Tulane University, Department of.....	491
Tropical Medicine Congress, to Meet in Washington, May, 1948, International.....	1306

News from the Field (and Fillers)—Cont.	Page	News from the Field (and Fillers)—Cont.	Page
Tropical Medicine, McGill to Grant		Waksman, Hansen Medal to Professor..	1508
Degree in.....	1630	Waksman, Selman A., M.D., Passano	
"Trustee" Begins Publication.....	1364	Foundation Award to.....	818
Tuberculosis, British Conference on....	514	Washington Report on the Medical	
Tuberculosis Research Center to Supply		Sciences.....	1084
BCG Vaccine.....	1508	Washington, School of Medicine at	
Tulane University, Department of Trop-		University of.....	212
ical Medicine and Public Health for..	491	Washington University. See: Univer-	
Typhus Commission Medal to Col.		sity Courses in Hospital Administra-	
Rudolph.....	1234	tion.....	791
Ulster County, N. Y., Organizes Full-		Water, Milk, and Other Foods, Disease	
time County Department of Health...	245	Outbreaks through.....	425
United Nations, International Exchange		Water Works Personnel, In-Service	
of Public Health Specialists, through..	343	Training Course for.....	490
United Nations Secretariat, Chest		Western Reserve Institute on Medical	
X-rays for.....	241	Care and Human Values.....	127
UNRRA See: Dr. Rajchman Named		West, Olin M., M.D., Resigns as	
Head of United Nations Children's		President-Elect of AMA.....	635
Emergency Fund.....	344	West Virginia:	
United States Army Opens Rehabilita-		Charleston and Kanawha County	
tion Center for Hard of Hearing....	132	Health Departments Merge.....	1238
U. S. Congress Considers Department		Public Health Association.....	1241
of Health, Education and Security...	339	Public Health Council, Two New	
United States Makes Isotopes Available		Bureaus Created by.....	1238
to the World.....	1506	Rapid Treatment Center Transferred	
U. S. President's 1947 Health Message..	1077	to State Health Department.....	1083
U. S. Public Health Service:		Strengthens Permissive Health Unit	
Pharmacy Section in Hospital		Law.....	796
Division.....	1366	What Is a Public Health Engineer or	
Research Plans Announced by.....	239	a Sanitarian?.....	1290
Veterinary Public Health Section of..	244	Whitney Foundation to Study Rheuma-	
U. S. Senate Appoints Citizens' Ad-		tic Fever.....	1236
visory Council of Social Security....	1506	WHO Public Health Fellowships.....	1507
U. S. Senate Hearings on Proposed		WHO Sponsors "Faculty on Wheels"	
Cabinet Status for Public Health....	632	to Austria and Hungary.....	954
U.S.S.R. Appoints Minister of Health		Wickenden Elmira Bears, First Nurse	
for Soviet Union.....	632	to Receive Medal for Merit.....	1635
University Courses in Hospital Admin-		Winslow, C.-E. A., Professor, Honored	
istration.....	794	at Yale.....	795
University of North Carolina, Dr. Mc-		Women's Clubs Support Cancer and	
Gavran Appointed Dean at.....	634	Heart Programs.....	1460
Utah Public Health Association.....	1241	Work Shop in Education for Health	
Vassar College Summer Institute. See:		and Fitness.....	440
Family and Community Living.....	720	World Health Charter, Two More	
Vaux, N. W., M.D. Appointed Pennsyl-		Nations Ratify.....	340
vania State Secretary of Health....	343	World Health Organization.....	950
Venereal Disease Control Council, The		World Health Organization, President	
Army Forms a.....	629	Urges U. S. Participation in.....	631
Venereal Diseases, International Union		World Health Organization:	
against the.....	1636	Fourth Interim Health Commission	
Venereal Diseases, International Union		Meets in Geneva.....	1316
for Combating.....	243	International Exchange of Public	
Ventilation of Garages and Plants....	1363	Health Specialists Through United	
Verhoeff, Frederick H., M.D., Annual		Nations.....	343
Dana Medal to.....	1638	World Medical Association.....	340
Veterans, Red Cross Services to.....	128	World-wide Cooperation in Public	
Veterinary Public Health Section of		Health, Progress in.....	268
U. S. Public Health Service.....	244	World-wide Medical Relief, 1947 Drive	
Virginia Extends Local Health Service..	1241	for.....	430
Virgin Islands Department of Health,		Wright, Sir Almroth Edward, Typhoid	
Appointments in.....	1636	Hero, Dies.....	952
Virgin Islands Extends Health		Yale University. See: University	
Services.....	635	Courses in Hospital Administration..	794
Vital Statistics. See: Confidential		Year 1946 in Public Health, The.....	258
System for Filling True Cause of		Youth Service News.....	1084
Death.....	188	Yugoslav Visitors in United States....	131
Vitamin A Fund, Mead Johnson.....	131		
Newspapers—Public Health Allies. Paul F. Ellis.....	907		
New York City, An Outbreak of Smallpox in. Israel Weinstein, M.D.....	1376		
New York City Elementary Schools, An Evaluation of the Effectiveness of the Astoria			
Plan for Medical Service in Two. Alfred Yankauer, Jr., M.D.....	853		
Next Steps in Industrial Hygiene Research. Paul A. Neal, M.D.....	1104		

	Page
North Carolina. See: The American Academy of Pediatrics Study of Child Health Services: Results to Date. Katherine Bain, M.D., John P. Hubbard, M.D., and Charles L. Williams, Jr., M.D., M.P.H.....	1297
Notable Evaluation of School Health Services, A. Editorial.....	913
Nuclear Energy, Safe and Beneficial Utilization of. Andrew H. Dowdy, M.D.....	1291
Nurses in Industry, Functions of Standing Orders for the. Irving R. Tabershaw, M.D., and Margaret S. Hargreaves, R.N.....	1430
Nurse's Contribution in the Annual Planning of a Public Health Program, The Public. Marion W. Sheahan, R.N.....	1586
Nurse's Role in Health Education in Industry, The. Bethel J. McGrath, R.N.....	298
Nursing Education Is a Professional Problem. Editorial.....	1046
Nutrients, Ideal Intake of Calories and Specific. Fredrick J. Stare, M.D.....	515
Nutrition and Vital Resistance. Editorial.....	915
Nutrition in a Public Health Program, The Place of. Wilson Jameson, K.C.B., M.D.....	1371
Nutrition Research in Canned Foods, Current Trends in. R. W. Pilcher, Ph.D., and B. S. Clark, D.Sc. ....	702
Nutrition. See: Calories, Food, Nutrients.	
Nutrition. See: Effect of Restricted Feeding upon Aging and Chronic Diseases in Rats and Dogs. C. M. McCay, Ph.D.....	521
Nutritional deficiency. See: The Importance of Controls in Public Health Field Studies. Editorial .....	72
Nutritional Status, Appraisal of. Including Some Recent Observations on Iron and Lactobacillus casei Factor (Vitamin M, Folic Acid). William J. Darby, M.D., Ph.D....	688
Nyswander, Dorothy B., Ph.D. What Is Health Education? .....	650

## O

Ober, R. E., M.D., Horton, R. J. M., M.D., and Feemster, Roy F., M.D., Dr.P.H. Congenital Defects in a Year of Epidemic Rubella.....	1328
Occupational cancer. See: Preventive Aspects of Cancer Control. Herbert L. Lombard, M.D., M.P.H. ....	170
Occupational medicine. See: A Future for Industrial Medicine. Leonard J. Goldwater, M.D. ....	1247
Olson, Byron J., M.D., Bell, Joseph A., M.D., and Emmons, Chester W., Ph.D. Studies on Histoplasmosis in a Rural Community.....	441
O'Malley, Martha, M.D., and Burney, L. E., M.D. The Hospital Planning and Licensing Programs in Indiana. Hospital Relations—A Symposium.....	1533
Opportunities for the Engineer in Public Health. Robert N. Clark.....	1399
Oral Environment and Fluorine. Gerald J. Cox, Ph.D.....	1151
See: Progress in the Use of Fluorine for the Control of Dental Caries. Editorial.....	1172
Orr, Sir John Boyd. See: The Lasker Awards for 1947.....	1616
Otological clinics. See: Hearing.	
Outbreak of Smallpox in New York City, An. Israel Weinstein, M.D.....	1376

## P

Parran, Thomas, M.D. See: The Lasker Awards for 1947.....	1612
Parsons, Elizabeth I., Sc.D., Updike, Elaine, Sc.D., and Frobisher, Martin, Jr., Sc.D. The Correlation of Laboratory and Clinical Evidence of Virulence of <i>C. diphtheriae</i> .....	543
Pasteur Institute of Dakar, Yellow Fever Vaccination, Simple or Associated with Vaccination Against Smallpox, of the Populations of French West Africa by the Method of the Mécécin-Général Maurice Peltier.....	1026
Pasteurizing and Aging Cheese. See: Cheese and Its Relation to Disease. F. W. Fabian, Ph.D. ....	987
Pathology, General Review and New Developments at the Army Institute of. Colonel J. E. Ash, M.C., U.S.A.....	815
Pathology, Public Health Aspects of Wartime Studies Conducted at the Army Institute of. Major Ruell A. Sloan, M.C., AUS.....	819
Patterson, Raymond S., Ph.D. A Selected Public Health Bibliography with Annotations .....	102, 226, 325, 472, 611, 777, 933, 1056, 1319, 1488, 1609
Pediatrics, The American Academy of, Study of Child Health Services: Results to Date. Katherine Bain, M.D., John P. Hubbard, M.D., and Charles L. Williams, Jr., M.D., M.P.H.....	1297
Pellitteri, Ottavio J., M.D., Jellison, William L., and Greenberg, Morris, M.D. Rickettsialpox—A Newly Recognized Rickettsial Disease. III. Epidemiology.....	860
Peltier, Maurice, Mécécin-Général. Yellow Fever Vaccination, Simple or Associated with Vaccination Against Smallpox, of the Populations of French West Africa by the Method of the Pasteur Institute of Dakar.....	1026
Penicillin, Demonstration of Hormesis (Increase in Fatality Rate) by. W. A. Randall, Ph.D., C. W. Price, and H. Welch, Ph.D.....	421
Penicillin in the Treatment of Infectious Bovine Mastitis. C. S. Bryan, Ph.D., D.V.M.....	1147
People Win for Public Health in Colorado, The. Florence R. Sabin, M.D.....	1311

Perkins, James E., M.D., Bahlke, Anne M., M.D., and Silverman, Hilda Freeman. Effect of Ultra-violet Irradiation of Classrooms on Spread of Measles in Large Rural Central Schools . . . . .	529
Perkins, James E., M.D., Chairman. Report of the Subcommittee for the Evaluation of Methods to Control Air-borne Infections, of the Committee on Research and Standards. The Present Status of the Control of Air-borne Infections . . . . .	13
Personals. See: News from the Field.	
Personnel Administration, An Investment in. Credit Lines . . . . .	314
Personnel. See: Today's Key to Better Public Health Service. William P. Shepard, M.D., and Reginald M. Atwater, M.D. . . . .	278
Pertussis Vaccine; Mouse Protection Tests in the Study of. A Comparative Series Using the Intracerebral Route for Challenge. P. L. Kendrick, Sc.D., Grace Eldering, Sc.D., M. K. Dixon, and J. Misner . . . . .	803
Peter, W. W., M.D., Dr.P.H. What Is Health Education? . . . . .	651
Phelps, Percy M., Stone, Raymond V., D.V.M., Tiedeman, Walter D., M.C.E., Buchbinder, Leon, Ph.D., and Buck, Theodore C., Jr. Investigations of the Swab Rinse Technic for Examining Eating and Drinking Utensils . . . . .	373
Pilcher, R. W., Ph.D., and Clark, B. S., D.Sc. Current Trends in Nutrition Research in Canned Foods . . . . .	702
Place of Nutrition in a Public Health Program, The. Wilson Jameson, K.C.B., M.D. . . . .	1371
Planning and Evaluation of Health Procedures, Statistics in the. Hugo Muench, M.D., Dr.P.H. . . . .	1273
Planning for the Chronically Ill. Joint Statement of Recommendations by the American Hospital Association, American Medical Association, American Public Health Association, and American Public Welfare Association . . . . .	1256
Planning for the Control of Stream Pollution. Editorial . . . . .	1042
Plant poisoning. See: Rhus Dermatitis as a Public Health and Health Education Problem. C. E. Turner, Ed.M., Sc.D., Dr.P.H. . . . .	7
Plotz, Harry, M.D. The Routine Virus and Rickettsial Diagnostic Laboratory. Wartime Army Medical Laboratory Activities—A Symposium . . . . .	836
Poison Ivy. See: Plant poisoning.	
Pollomyelitis in Certain California Cities, Comparative Epidemiology of. W. McD. Hammon, M.D., Dr.P.H. . . . .	1545
Pollomyelitis Virus in Water by Chlorination. II. Inactivation of Partially Purified. Serge G. Lensen, Ph.D., Morris Rhian, M.S., and Max R. Stebbins . . . . .	869
Pond, M. Allen. Need for Systematic Evaluation of Substandard Housing . . . . .	967
Pond, M. Allen, and Hathaway, John S., M.D. An Epidemic of Mild Gastroenteritis of Unknown Etiology Presumably Spread by Contaminated Eating Utensils . . . . .	1402
Population Data for Cities, Postcensal. Henry S. Shryock, Jr., Ph.D. . . . .	1455
Postcensal Population Data for Cities. Henry S. Shryock, Jr., Ph.D. . . . .	1455
Poultry. See: Eggs.	
Prepayment Medical Care Plans and Public Health Agencies, Rural. Mark Ziegler, M.D., E. Richard Weirnerman, M.D., and Milton I. Roemer, M.D., M.P.H. . . . .	1578
Present Recommendations Concerning Treatment and Prophylaxis of Diphtheria. Franklin H. Top, M.D., M.P.H. . . . .	549
Present Status of the Control of Air-borne Infections, The. Report of the Subcommittee for the Evaluation of Methods to Control Air-borne Infections, of the Committee on Research and Standards. James E. Perkins, M.D., Chairman . . . . .	13
Present Status of the Control of Air-borne Infections, The. See: Credit Where Credit Is Due. Credit Lines . . . . .	314
Present Status of Vaccination Against Influenza, The. Report of the Subcommittee on Evaluation of Administrative Practices. Committee on Administrative Practice. Thomas Francis, Jr., M.D., Chairman . . . . .	1109
Presidential Address, 1947. See: The Stems and Roots of Public Health Practice. Harry S. Mustard, M.D. . . . .	1513
Presidents of the American Public Health Association. Editorial . . . . .	1475
President Truman's Message to Congress on a National Health Program. See: Who Is Un-American Now? Editorial . . . . .	1592
Preventive Aspects of Cancer Control (Problems of an Aging Population). Herbert L. Lombard, M.D., M.P.H. . . . .	170
Preventive Medicine, Group Practice in. Dean A. Clark, M.D. . . . .	264
Preventive Medicine. See: Planning for the Chronically Ill. . . . .	1256
Price, C. W., Welch, H., Ph.D., and Randall, W. A., Ph.D. Demonstration of Hormesis (Increase in Fatality Rate) by Penicillin . . . . .	421
Princeton Conference on Local Health Units, The . . . . .	1502
Principles of a State "Equalization" Program. Editorial . . . . .	310
Problem Drinking—A Public Health and Municipal Responsibility. Lyman C. Duryea, M.D., M.P.H. . . . .	1567
See: Alcoholism a Public Health Problem? Editorial . . . . .	1595
Problem of Reconstituted Milk, The. George H. Hauser, M.D., and William H. King . . . . .	1284
Problems and Errors in Assigning Causes of Bacterial Food Poisoning. G. M. Dack, Ph.D., M.D. . . . .	360
Problems of an Aging Population: Setting the Stage. Louis I. Dublin, Ph.D. . . . .	152

Problems of an Aging Population—Continued	Page
Care of the Aged and Chronically Ill. Theodore G. Klumpp, M.D.....	156
Sheltered Care of the Aged. Joseph H. Kinnaman, M.D., M.P.H.....	163
Preventive Aspects of Cancer Control. Herbert L. Lombard, M.D., M.P.H.....	170
Public Health Aspects of Diabetes. Hugh L. C. Wilkerson, M.D., M.P.H.....	177
See: Diseases of an Aging Population. Editorial.....	209
Problems of Chronic Illness, The. Editorial.....	1339
Proceedings of the National Conference on Local Health Units. Supplement to January, 1947, Journal.	
Professional Education. See: Committee Reports.	
Program Audit—A Device for Reflecting Public Health Performance. Evelyn Flook and Joseph W. Mountin, M.D.....	1137
Progress in the Use of Fluorine for the Control of Dental Caries. Editorial.....	1172
Prophylaxis of Diphtheria, Present Recommendations Concerning Treatment and. Franklin H. Top, M.D., M.P.H.....	549
Proposed Report on Field Training of Public Health Personnel. Committee on Professional Education. William P. Shepard, M.D., Chairman.....	709
Proposed Report on the Educational Qualifications of Public Health Engineers. Committee on Professional Education. William P. Shepard, M.D., Chairman.....	34
Proposed Statistical Classification of Diseases, Injuries, and Causes of Death. Prepared by the United States Subcommittee. Edward S. Rogers, M.D., Chairman of Subcommittee on the Sixth Revision of the International List of Causes of Death of the Committee on Research and Standards.....	1017, 1071
Pseudomonas aeruginosa, An Epidemic of Diarrhea in a New-born Nursery Caused by. Charles A. Hunter, Ph.D., and Paul R. Ensign, M.D., M.P.H.....	1166
Public Health Allies—Newspapers. Paul F. Ellis.....	907
Public Health Aspects of Dehydrated Foods. Progress Report of the Committee on Foods (Except Milk). Harry W. von Loesecke, Chairman.....	1334
Public Health Aspects of Diabetes (Problems of an Aging Population). Hugh L. C. Wilkerson, M.D., M.P.H.....	177
Public Health Aspects of Wartime Studies Conducted at the Army Institute of Pathology. Wartime Army Medical Laboratory Activities—A Symposium. Major Ruell A. Sloan, M.C., AUS.....	819
Public Health as Seen by English Eyes. Editorial.....	72
See: Public Health Work in England; How It is Like and Unlike Ours. Margaret G. Arnstein, R.N., M.P.H.....	83
Public Health Degrees and Certificates Granted in the United States and Canada During the Academic Year, 1945-1946. Report of the Committee on Professional Education. William P. Shepard, M.D., Chairman.....	67
Public Health Engineering, Municipal. Data on Current and Proposed Local Sanitation Divisions. Report of the Committee on Municipal Public Health Engineering. Leonard M. Board, Chairman.....	901
Public Health in England: How It is Like and Unlike Ours. Margaret G. Arnstein, R.N., M.P.H.....	83
See: Public Health as Seen by English Eyes. Editorial.....	72
Public Health Nurse's Contribution in the Annual Planning of a Public Health Program, The. Marion W. Sheahan, R.N.....	1586
Public Health Personnel, Proposed Report on Field Training of. Committee on Professional Education. William P. Shepard, M.D., Chairman.....	709
Public Health Practice, Public Opinion Measurement as an Instrument in. Homer N. Calver and Otis T. Wingo, Jr.....	426
Public Health Practice, The Stems and Roots of. Harry S. Mustard, M.D.....	1513
Public Opinion Measurement as an Instrument in Public Health Practice. Homer N. Calver and Otis T. Wingo, Jr.....	426
Puch, Theodore T., Ph.D., Loosli, Clayton G., M.D., Smith, Margaret H. D., M.D., Gauld, Ross L., M.D., and Robertson, Oswald H., M.D. Control of Cross-Infections in Infants' Wards by the Use of Triethylene Glycol Vapor.....	1385

## Q

Q Fever at the National Institute of Health, Report of an Outbreak of. II. Epidemiological Features. Robert J. Huebner, M.D.....	431
Qualifications of Public Health Engineers, Proposed Report on the Educational. William P. Shepard, M.D., Chairman.....	34
Quaternary Ammonium and Hypochlorite Products, A Method for Assessing the Sanitizing Efficiency of. C. K. Johns, Ph.D.....	1322
Quilligan, J. J., Jr., M.D., Francis, Thomas, Jr., M.D., and Salk, Jonas E., M.D. Experience with Vaccination Against Influenza in the Spring of 1947.....	1013

## R

Radiation hazards. See: Nuclear Energy.	
Randall, Raymond, Colonel, V.C., U.S.A. Wartime Activities of the Army Veterinary Laboratories. Wartime Army Medical Laboratory Activities—A Symposium.....	829
Randall, W. A., Ph.D., Price, C. W., and Welch, H., Ph.D. Demonstration of Hormesis (Increase in Fatality Rate) by Penicillin.....	421

Rat as a Source of Erysipelothrix rhusiopathiae, The Common. Charles H. Drake, Ph.D., and Elizabeth R. Hall, M.S.....	846
Rat Control Program, Baltimore's Community. John T. Emlen, Jr., Ph.D.....	721
Rats and Dogs, Effect of Restricted Feeding Upon Aging and Chronic Diseases in. C. M. McCay, Ph.D. ....	521
Recent Studies on Disinfection of Air in Military Establishments. Report of the Committee on Sanitary Engineering, National Research Council, Division of Medical Sciences. Abel Wolman, Chairman.....	189
Recommended Procedure for the Bacteriological Examination of Shellfish and Shellfish Waters. Revision of Recommended Methods of Procedure. Standard Methods Committee for the Examination of Shellfish. James Gibbard, Chairman.....	1121
Reconstituted Milk, The Problem of. George H. Hauser, M.D., and William H. King.....	1284
Reed, Lowell J., M.D. See: The Lasker Awards for 1947.....	1612
Regionalism as a Tool for Research and Social Engineering. John E. Ivey, Jr., Ph.D.....	879
Regionalism in Relation to the Health of the Public. Carl W. Strow, Ph.D.....	889
Regulation of Housing: Hints for Health Officers. Charles S. Ascher, LL.B.....	507
Rehabilitation. See: Disabled Veterans Not Vocationally Handicapped. Credit Lines....	215
Reinartz, Brig. Gen. Eugen G., M.D. Is Aviation Medicine Industrial Hygiene?.....	1130
Reinhold, John G., Ph.D., Stokes, Joseph, Jr., M.D., Neefe, John R., M.D., and Baty, James B., Major, Sn.C., A.U.S. Inactivation of the Virus of Infectious Hepatitis in Drinking Water . . . . .	365
Relation of Certain Cooking Procedures to Staphylococcus Food Poisoning. Dorothy L. Hussemann, Ph.D., and F. W. Tanner, Ph.D.....	1407
Report of an Outbreak of Q Fever at the National Institute of Health. II. Epidemiological Features. Robert J. Huebner, M.D.....	431
Report of the Chairman of the Executive Board of the American Public Health Association to the Governing Council, 1945-1946. Abel Wolman, Dr.Eng.....	59
Research and Social Engineering, Regionalism as a Tool for. John E. Ivey, Jr., Ph.D.....	879
Resolutions Adopted by the Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio . . . . .	107
Resolutions, adopted by the Association at the Seventy-fifth Annual Meeting in Atlantic City, N. J., October 8, 1947.....	1620
Respiratory diseases. See:	
Influenza:	
Recent Studies on Disinfection of Air in Military Establishments. Report of the Committee on Sanitary Engineering, National Research Council, Division of Medical Sciences. Abel Wolman, Chairman.....	189
Sudden Deaths of Infants Allegedly Due to Mechanical Suffocation. Jacob Werne, M.D., and Irene Garrow, M.D.....	675
Responsibility of the Health Officer in a Medical Care Program. (The Health Department and Medical Care.) F. W. Jackson, M.D.....	253
Restaurants. See: Dishwashing, Eating and Drinking Utensils, Food Utensils.	
Restaurants, Dishwashing Practice and Effectiveness (Swab-rinse Test) in a Large City as Revealed by a Survey of 1,000. Hyman J. Kleinfeld, Ph.D., and Leon Buchbinder, Ph.D. ....	373
Restaurant Sanitation Goes Scientific. Editorial.....	574
Restricted Feeding upon Aging and Chronic Diseases in Rats and Dogs, Effect of. C. M. McCay, Ph.D.....	521
Review Articles—1947—Requested by Editorial Board:	
Brucellosis in the United States. Alice C. Evans.....	139
Dust and Its Control as a Means of Disinfection of Air. Clayton C. Loosli, Referee..	353
Health Councils in Local Communities. Bleecker Marquette.....	959
Future for Industrial Medicine, A. Leonard J. Goldwater, M.D.....	1247
Review of Induction and Discharge Examinations for Tuberculosis in the Army, A. Esmond R. Long, M.D., Ph.D., and Eugene L. Hamilton.....	412
Rhian, Morris, M.S., Stebbins, Max R., and Lensen, Serge G., Ph.D. Inactivation of Partially Purified Poliomyelitis Virus in Water by Chlorination. II.....	869
Rhus Dermatitis as a Public Health and Health Education Problem. C. E. Turner, Ed.M., Sc.D., Dr.P.H. ....	7
Riboflavin. See: Dairy Products.	
Rickettsia Burnettii. See: Q Fever.	
Rickettsial Diagnostic Laboratory, The Routine Virus and. Harry Plotz, M.D.....	836
Rickettsialpox—A Newly Recognized Rickettsial Disease. III. Epidemiology. Morris Greenberg, M.D., Ottavio J. Pellitteri, M.D., and William L. Jellison.....	860
Rivera, Manuel González, M.D. Health Education in Mexico.....	849
Roberts, Dean W., M.D. Maryland Medical Care Program.....	259
Robertson, Oswald H., M.D., Puck, Theodore T., Ph.D., Loosli, Clayton G., M.D., Smith Margaret, H.D., M.D., and Gauld, Ross L., M.D. Control of Cross-Infections in Infants' Wards by the Use of Triethylene Glycol Vapor.....	1385
Rocky Mountain Spotted Fever. See: Colorado Tick Fever. Lloyd Florio, M.D., Dr.P.H., and Mabel O. Stewart.....	203
Rocky Mountain Spotted Fever Vaccine. See: Report of an Outbreak of Q Fever at the National Institute of Health. II. Epidemiological Features. Robert J. Huebner, M.D....	431
Rodentidae. See: 1050.	

Rodents. See: Rat.	Page
Roemer, Milton I., M.D., M.P.H., Ziegler, Mark, M.D., and Weinerman, E. Richard, M.D.	
Rural Prepayment Medical Care Plans and Public Health Agencies.....	1578
Rogers, Edward S., M.D., Chairman of Subcommittee on the Sixth Revision of the International List of Causes of Death of the Committee on Research and Standards. Proposed Statistical Classification of Diseases, Injuries, and Causes of Death. Prepared by the United States Subcommittee.....	1017
Roots of Public Health Practice, The Stem and. Harry S. Mustard, M.D.....	1513
Routine Virus and Rickettsial Diagnostic Laboratory, The. Wartime Army Medical Laboratory Activities—A Symposium. Harry Plotz, M.D.....	836
Rubella, Congenital Defects in a Year of Epidemic. R. E. Ober, M.D., R. J. M. Horton, M.D., and Roy F. Feemster, M.D., Dr.P.H.....	1328
Rural Prepayment Medical Care Plans and Public Health Agencies. Mark Ziegler, M.D., E. Richard Weinerman, M.D., and Milton I. Roemer, M.D., M.P.H.....	1578

## S

Sabin, Florence R., M.D. The People Win for Public Health in Colorado.....	1311
Safe and Beneficial Utilization of Nuclear Energy. Andrew H. Dowdy, M.D.....	1291
Salaries. See: Are Our Health Defenses Crumbling? Editorial.....	455
Salaries. See: Public Health Personnel.	
Salary Information, Clearing House on Public Health.....	576, 762, 916, 1175, 1477
Salk, Jonas E., M.D., Quilligan, J. J., Jr., M.D., and Francis, Thomas, Jr., M.D. Experience with Vaccination Against Influenza in the Spring of 1947.....	1013
Salmonella, H. Incidence and Types of. Microbiology of Spray-dried Whole Egg. Mathilde Solowey, Ph.D., Vernon H. McFarlane, Ph.D., E. H. Spaulding, Ph.D., and Cecilia Chemerda.....	971
Sanitizing Efficiency of Quaternary Ammonium and Hypochlorite Products, A Method for Assessing the. C. K. Johns, Ph.D.....	1322
Saskatchewan, Canada. See: Hospital Relations.	
Sawyer, Wilbur A., M.D., LL.D. Achievements of UNRRA as an International Health Organization.....	41
School Health Program, Use of Body Measurements in the. Part III. Howard V. Meredith, Ph.D., and Harold C. Stuart, M.D.....	1435
School Health Service, A Notable Evaluation. Editorial.....	913
Selected Public Health Bibliography with Annotations, A. Raymond S. Paterson, Ph.D.....	102, 226, 325, 472, 611, 777, 933, 1056, 1349, 1488, 1609
Serologic Reactivity with Lipid Antigens, Universal. Reuben L. Kahn, Sc.D.....	283
Setting the Stage (Problems of an Aging Population). Louis I. Dublin, Ph.D.....	152
Sexton, Anna M. Report of the Archivist, 1946.....	749
Sex Variations in Hospital Utilization, Age and. (An Example of Morbidity Data Available from Blue Cross Records) J. D. Colman, M.E.....	1307
Sheahan, Marion W., R.N. The Public Health Nurse's Contribution in the Annual Plans of a Public Health Program.....	1586
Shellfish and Shellfish Waters, Recommended Procedure for the Bacteriological Examination of. Revision of Recommended Methods of Procedure. Standard Methods Committee for the Examination of Shellfish. James Gibbard, Chairman.....	1121
Shellfish. Progress Report of the Committee on Shellfish (Engineering Section). M. H. Bidwell, Chairman.....	983
Sheltered Care of the Aged (Problems of an Aging Population). Joseph H. Kinnaman, M.D., M.P.H.....	163
Shepard, William P., M.D., Chairman. Committee on Professional Education.	
Proposed Report on the Educational Qualifications of Public Health Engineers.....	34
Proposed Report on Field Training of Public Health Personnel.....	709
Public Health Degrees and Certificates Granted in the United States and Canada During the Academic Year, 1945-1946.....	67
Shepard, William P., M.D., and Atwater, Reginald M., M.D. Today's Key to Better Public Health Service.....	278
Shigella Typing by Antigenic Analysis, Development of. Philip R. Carlquist, Major, PC., U.S.A.....	840
Shryock, Henry S., Jr., Ph.D. Postcensal Population Data for Cities.....	1455
Signs of Progress in Dental Health. Allen O. Gruebbel, D.D.S., M.P.H.....	1160
Silverman, Hilda Freeman, Perkins, James E., M.D., and Bahilke, Anne M., M.D. Effect of Ultra-violet Irradiation of Classrooms on Spread of Measles in Large Rural Central Schools.....	529
Simplified Procedure for the Collection of Basic Data for Dental Program Planning and Appraisal. John W. Knutson, D.D.S., Dr.P.H.....	1439
Simpson, Donald F., Mountain, Joseph W., M.D. and Cheney, Bess A. Merit System Administration in Official Health Agencies.....	23
Sinai, Nathan, Dr.P.H. Experience and Lessons from Emergency Maternity and Infant Care.....	1097
Sloan, Major Ruell A., M.C., AUS. Public Health Aspects of Wartime Studies Conducted at the Army Institute of Pathology. Wartime Army Medical Laboratory Activities—A Symposium.....	819
Smallpox in New York City, An Outbreak of. Israel Weinstein, M.D.....	1376



Smallpox, of the Populations of French West Africa by the Method of the Pasteur Institute of Dakar, Yellow Fever Vaccination, Simple or Associated with Vaccination Against. M <sup>d</sup> écin-Général Maurice Peltier.....	1026
Smith, Homer, D.Sc. See: The Lasker Awards for 1947.....	1612
Smith, Margaret H.D., M.D., Gauld, Ross L., M.D., Robertson, Oswald H., M.D., Puck, Theodore T., Ph.D., and Loosli, Clayton C., M.D. Control of Cross-Infections in Infants Wards by the Use of Triethylene Glycol Vapor.....	1385
Social Security Act. See: Merit System Administration in Official Health Agencies. Joseph W. Mountin, M.D., Bess A. Cheney, and Donald F. Simpson.....	23
Social Statistics for the City, Health and. Halbert L. Dunn, M.D., Ph.D.....	739
Solowey, Mathilde, Ph.D., McFarlane, Vernon H., Ph.D., Spaulding, E. H., Ph.D., and Chernerda, Cecilia. Microbiology of Spray-dried Whole Egg. II. Incidence and Types of Salmonella.....	971
Sosa, José, Q.B.P., and León, Alberto P., M.D., M.P.H. Allergy in Brucellosis.....	1033
Spaulding, E. H., Ph.D., Chernerda, Cecilia, Solowey, Mathilde, Ph.D., and McFarlane, Vernon H., Ph.D. Microbiology of Spray-dried Whole Egg. II. Incidence and Types of Salmonella.....	971
Spielholz, Jess B., M.D., and Val Brakel, Iva. The Medical Social Worker in a County Health Department.....	733
Spray-dried Whole Egg, Microbiology of. II. Incidence and Types of Salmonella. Mathilde Solowey, Ph.D., Vernon H. McFarlane, Ph.D., E. H. Spaulding, Ph.D., and Cecilia Chernerda.....	971
Staff of Life, The. Editorial.....	211
Standard Methods, Coordinating Committee on. Friend Lee Mickle, Sc.D., Chairman.....	752
Standard Methods for Dairy Products. Report of the Joint Editorial Committee for Standard Methods for the Examination of Dairy Products. R. S. Breed, Ph.D., Chairman.....	755
Standard Methods for the Examination of Water and Sewage. See: Two Ninths. Editorial..	909
Standards for Dehydrated Foods, A Discussion of Bacteriological. Harry E. Goresline, Ph.D.....	1277
Standards for Frozen Foods? Editorial.....	312
Standards of Dental Care in Public Health Programs for Children. Norman F. Gerrie, D.D.S., M.P.H.....	1317
Standing Orders for the Nurses in Industry, Functions of. Irving R. Tabershaw, M.D., and Margaret S. Hargreaves, R.N.....	1430
Staphylococcus Food Poisoning, Relation of Certain Cooking Procedures to. Dorothy L. Hussemann, Ph.D., and F. W. Tanner, Ph.D.....	1407
Stare, Fredrick J., M.D. Ideal Intake of Calories and Specific Nutrients.....	515
State "Equalization" Program, Principles of a. Editorial.....	310
Statistical Data in State Health Departments, Uses of. Ellen B. Whiteman.....	1267
Statistics, Administrative and Research Use of Routine Analyses of Hospital. Paul M. Densen, D.Sc.....	1421
Statistics for the City, Health and Social. Halbert L. Dunn, M.D., Ph.D.....	739
Statistics in the Planning and Evaluation of Health Procedures. Hugo Muench, M.D., Dr.P.H.....	1273
Statistics Through Periodic Sample Surveys of Households, Morbidity. Theodore D. Woolsey.....	1007
Stebbins, Max R., Lensen, Serge G., Ph.D., and Rhian, Morris, M.S. Inactivation of Partially Purified Poliovirus in Water by Chlorination. II.....	809
Stems and Roots of Public Health Practice, The. Harry S. Mustard, M.D.....	1513
Stewart, Mabel O., and Florio, Lloyd, M.D., Dr.P.H. Colorado Tick Fever.....	293
Stokes, Joseph, Jr., M.D., Neefe, John R., M.D., Baty, James B., Major Sn.C., A.U.S., and Reinhold, John G., Ph.D. Inactivation of the Virus of Infectious Hepatitis in Drinking Water.....	365
Stone, Raymond V., D.V.M., Tiedeman, Walter D., M.C.E., Buchbinder, Leon, Ph.D., Buck, Theodore C., Jr., and Phelps, Percy M. Investigations of the Swab Rinse Technique for Examining Eating and Drinking Utensils.....	373
Story of Brucellosis, The. Editorial.....	208
See: Brucellosis in the United States.....	130
Stream Pollution, Planning for the Control of. Editorial.....	1042
Strow, Carl W., Ph.D. Regionalism in Relation to the Health of the Public.....	889
Stuart, Harold C., M.D., and Meredith, Howard V., Ph.D. Use of Body Measurements in the School Health Program. Part III.....	1435
Studies of the Effect of the Provision of Good Housing on Health. Progress Report by the Joint Committee on Housing and Health of the American Public Health Association and the National Association of Housing Officials. Bleecker Marquette, Chairman..	303
Studies on Histoplasmosis in a Rural Community. Byron J. Olson, M.D., Joseph A. Bell, M.D., and Chester W. Emmons, Ph.D.....	441
Subsidy to Local Health Departments, Criteria for the Allocation of. John A. Kahl, M.D., M.P.H.....	199
Sudden Deaths of Infants Allegedly Due to Mechanical Suffocation. Jacob Werne, M.D., and Irene Garrow, M.D.....	675
Suffocation, Sudden Deaths of Infants Allegedly Due to Mechanical. Jacob Werne, M.D., and Irene Garrow, M.D.....	675

	Page
Swab Rinse Technic for Examining Eating and Drinking Utensils, Investigations of the. Leon Buchbinder, Ph.D., Theodore C. Buck, Jr., Percy M. Phelps, Raymond V. Stone, D.V.M., and Walter D. Tiedeman, M.C.E.....	373
Swab-rinse Test in a Large City as Revealed by a Survey of 1,000 Restaurants, Dishwashing Practice and Effectiveness. Hyman J. Kleinfeld, Ph.D., and Leon Buchbinder, Ph.D....	379
Symposia:	
Problems of an Aging Population. February.....	152
The Health Department and Medical Care. March.....	253
What is Health Education? June.....	641
Wartime Army Medical Laboratory Activities. July.....	811
Hospital Relations. December.....	1519
Syphilis. See: False Positives.	
Syphilis Serology, Cardiolipin and Purified Lecithin as Reagents in. Ad Harris and J. F. Mahoney, M.D.....	907

## T

Tabershaw, Irving R., M.D., and Hargreaves, Margaret S., R.N. Functions of Standing Orders for the Nurses in Industry.....	1430
Tabulating Causes of Illness, Importance of a Standard Code for. Selwyn D. Collins, Ph.D. ....	1002
Tanner, F. W., Ph.D., and Hussemann, Dorothy L., Ph.D. Relation of Certain Cooking Procedures to Staphylococcus Food Poisoning.....	1407
Tennessee, An Epidemic of an Acute Meningo-encephalitis in Giles County. Walter C. Humbert, M.D., C. B. Tucker, M.D., K. T. Mosley, M.D., and L. K. Bishop, M.D.....	564
Thiamin. See: Dairy Products	
Tick Fever, Colorado. Lloyd Florio, M.D., Dr.P.H., and Mabel O. Stewart.....	293
Tiedeman, Walter D., M.C.E., Buchbinder, Leon, Ph.D., Buck Theodore C., Jr., Phelps, Percy M., and Stone, Raymond V., D.V.M. Investigations of the Swab Rinse Technic for Examining Eating and Drinking Utensils.....	373
Today's Key to Better Public Health Service. William P. Shepard, M.D., and Reginald M. Atwater, M.D.....	278
Top, Franklin H., M.D., M.P.H. Present Recommendations Concerning Treatment and Prophylaxis of Diphtheria.....	549
Toxicodendron. See: Rhus Dermatitis as a Public Health and Health Education Problem. C. E. Turner, Ed.M., Sc.D., Dr.P.H.....	7
Toxicology. See: Next Steps in Industrial Hygiene Research. Paul A. Neal, M.D.....	1104
Training Health Workers for Latin America. Editorial.....	1340
Treatment and Prophylaxis of Diphtheria, Present Recommendations Concerning. Franklin H. Top, M.D., M.P.H.....	549
Trends in Diphtheria, Foreign and Domestic. Gaylord W. Anderson, M.D., Dr.P.H.....	1
Triethylene Glycol Vapor, Control of Cross-Infections in Infants' Wards by the Use of. Clayton C. Loosli, M.D., Margaret H. D. Smith, M.D., Ross L. Gauld, M.D., Oswald H. Robertson, M.D., and Theodore T. Puck, Ph.D.....	1385
Tuberculosis in Infants and Children, An Evaluation of the Use of BCG in the Prevention of. Milton I. Levine, M.D.....	1089
Tuberculosis in the Army, A Review of Induction and Discharge Examination for. Esmond R. Long, M.D., Ph.D., and Eugene L. Hamilton.....	412
Tuberculosis. See: BCG. Editorial.....	307
Tucker, C. B., M.D., Mosley, K. T., M.D., Bishop, L. K., M.D., and Humbert, Walter C., M.D. An Epidemic of an Acute Meningo-encephalitis in Giles County, Tennessee.....	564
Turner, C. E., Ed.M., Sc.D., Dr.P.H. Rhus Dermatitis as a Public Health and Health Education Problem.....	7
2-4 dichlorophenoxyacetic acid (2, 4-d). See: Chemical herbicides.	
Two Ninths. Editorial.....	909
Typhoid Fever. See: Demonstration of Hormesis (Increase in Fatality Rate) by Penicil- lin. W. A. Randall, Ph.D., C. W. Price, and H. Welch, Ph.D.....	421
Typhoid, Typhus. See: UNRRA	

## U

Ultra-violet irradiation. See: Air-borne Infections. Disinfection of air.	
Ultra-violet Irradiation of Classrooms on Spread of Measles in Large Rural Central Schools, Effect of. James E. Perkins, M.D., Anne M. Bahlke, M.D., and Hilda Free- man Silverman.....	529
Un-American Now?, Who is. Editorial.....	1592
Undulant fever. See: Brucellosis.	
Union Contract and Industrial Hygiene, The. Bernard S. Coleman.....	1449
United Nations Relief and Rehabilitation Administration. See: UNRRA.	
Universal Serologic Reactivity with Lipid Antigens. Reuben L. Kahn, Sc.D.....	283
UNRRA as an International Health Organization, Achievements of. Wilbur A. Sawyer, M.D., LL.D.....	41

	Page
Updyke, Elaine, Sc.D., Frobisher, Martin, Jr., Sc.D. and Parsons, Elizabeth I., Sc.D. The Correlation of Laboratory and Clinical Evidence of Virulence of <i>C. diphtheriae</i> ...	543
Use of Body Measurements in the School Health Program. Part III. Supplementary Note Supplying Measurement and Rating Equivalents for Thickness of Skin and Subcutaneous Tissue below Left Scapula and above Left Ilium. Howard V. Meredith, Ph.D., and Harold C. Stuart, M.D.....	1435
Use of Census Tracts in the Analysis of City Health Problems. Howard Whipple Green....	538
Uses of Statistical Data in State Health Departments. Ellen B. Whiteman, M.P.H.....	1267

## V

Vaccination Against Influenza in the Spring of 1947, Experience with. Thomas Francis, Jr., M.D., Jonas E. Salk, M.D., and J. J. Quilligan, Jr., M.D.....	1013
Vaccination Against Influenza, The Present Status of. Report of the Subcommittee on Evaluation of Administrative Practices, Committee on Administrative Practice. Thomas Francis, Jr., M.D., Chairman.....	1109
Vaccination Against Smallpox, of the Populations of French West Africa by the Method of the Pasteur Institute of Dakar, Yellow Fever Vaccination, Simple or Associated with. Mécécin-Général Maurice Peltier.....	1026
Vaccination. See:	
An Outbreak of Smallpox in New York City. Israel Weinstein, M.D.....	1376
Evaluation of the Use of BCG in the Prevention of Tuberculosis in Infants and Children. An. Milton I. Levine, M.D.....	1089
Val Brakel, Iva, and Spielholz, Jess B., M.D. The Medical Social Worker in a County Health Department.....	733
Value of Industrial Hygiene, The. T. Lyle Hazlett, M.D., F.A.C.P.....	1302
Ventilation and Atmospheric Pollution. See: Air Analysis	
Ventilation. See: Air-borne Infections, Disinfection of air	
Veterinary Laboratories, Wartime Activities of the Army. Raymond Randall, Colonel, V.C., U.S.A.....	829
Victory Over Maternal Mortality, The. Editorial.....	1476
Virus and Rickettsial Diagnostic Laboratory, The Routine. Harry Plotz, M.D.....	836
Virus diseases. See: Hepatitis.	
Vital Resistance, Nutrition and. Editorial.....	915
Vital statistics. See:	
Diseases of an Aging Population.....	209
Population, Problems of an Aging.....	152
Uses of Statistical Data in State Health Departments. Ellen B. Whiteman, M.P.H.....	1267
Statistics in the Planning and Evaluation of Health Procedures. Hugo Muench, M.D., Dr.P.H.....	1273
Vitamin A. See: Dairy Products.	
Vitamin M. See: Appraisal of Nutritional Status. Including Some Recent Observations on Iron and Lactobacillus casei Factor (Vitamin M, Folic Acid). William J. Darby, M.D., Ph.D.....	688
Vitamins. See: Diet, Food, Nutrients, Nutrition	
von Loesecke, Harry W., Chairman. Progress Report of the Committee on Foods (Except Milk). Public Health Aspects of Dehydrated Foods.....	1334

## W

Wallen, Richard Wm., Ph.D. Advertising Methods in Recruitment. Credit Lines.....	212
Wartime Activities of the Army Veterinary Laboratories. Wartime Army Medical Lab- oratory Activities—A Symposium. Raymond Randall, Colonel, V.C., U.S.A.....	829
Wartime Army Medical Laboratory Activities—A Symposium.	
The Wartime Army Medical Laboratory Organization. Gustave J. Dammin, M.D.....	811
General Review and New Developments at the Army Institute of Pathology. Colonel J. E. Ash, M.C., U.S.A.....	815
Public Health Aspects of Wartime Studies Conducted at the Army Institute of Path- ology. Major Ruell A. Sloan, M.C., A.C.S.....	819
Wartime Activities of the Army Veterinary Laboratories. Raymond Randall, Colonel, V.C., U.S.A.....	829
The Routine Virus and Rickettsial Diagnostic Laboratory. Harry Plotz, M.D.....	836
Development of Shigella Typing by Antigenic Analysis. Philip R. Carlquist, Major, P.C., U.S.A.....	840
Wartime Army Medical Laboratory Organization, The. Wartime Army Medical Laboratory Activities—A Symposium. Gustave J. Dammin, M.D.....	811
Water. See: Inactivation of the Virus of Infectious Hepatitis in Drinking Water. John R. Neefe, M.D., Major James B. Baty, Sn.C., A.C.S., John G. Reinhold, Ph.D., and Joseph Stokes, Jr., M.D.....	365
Water Supply, Report of the Committee on. Charles R. Cox, Chairman.....	555
Weighing the Baby. An Illustration.....	1589
Welferman, E. Richard, M.D., Roemer, Milton I., M.D., M.P.H., and Ziegler, Mark, M.D. Rural Prepayment Medical Care Plans and Public Health Agencies.....	1578
Weinstein, Israel, M.D. An Outbreak of Smallpox in New York City.....	1376

	Page
Welch, H., Ph.D., Randall, W. A., Ph.D., and Price, C. W. Demonstration of Hormesis (Increase in Fatality Rate) by Penicillin.....	421
Wells, W. F., Chairman. Bacteriological Procedures in Sanitary Air Analysis. Report of the Subcommittee on Bacteriological Procedures of the Special Committee on Standard Methods for the Examination of Air, administered by the Committee on Ventilation and Atmospheric Pollution.....	1023
Werne, Jacob, M.D., and Garrow, Irene, M.D. Sudden Deaths of Infants Allegedly Due to Mechanical Suffocation.....	675
What Is Health Education? A Symposium.	
W. W. Bauer, M.D.....	641
Herman N. Bundesen, M.D.....	642
Mary P. Connolly.....	642
Mayhew Derryberry, Ph.D.....	643
Thomas D. Dublin, M.D., Dr.P.H.....	644
Elizabeth G. Fox, R.N.....	645
Howard Whipple Green.....	646
William S. Groom.....	647
Sally Lucas Jean, R.N.....	647
Bleecker Marquette.....	648
Lucy S. Morgan, Ph.D.....	649
Dorothy B. Nyswander, Ph.D.....	650
W. W. Peter, M.D., Dr.P.H.....	651
Charles C. Wilson, M.D.....	651
What Is Health Education. Editorial.....	744
Whiteman, Ellen B., M.P.H. Uses of Statistical Data in State Health Departments.....	1267
Who is Un-American Now? Editorial.....	1592
Whooping Cough. See: Pertussis	
Wilbar, Charles L., Jr., M.D. Control of Dengue in Hawaii.....	663
Wilkerson, Hugh L. C., M.D., M.P.H. Public Health Aspects of Diabetes (Problems of an Aging Population).....	177
Williams, Charles L., Jr., M.D., M.P.H., Bain, Katherine M.D., and Hubbard, John P., M.D. The American Academy of Pediatrics Study of Child Health Services: Results to Date.....	1297
Wilson, Charles C., M.D. What Is Health Education?.....	651
Wingo, Otis T., Jr., and Calver, Homer N. Public Opinion Measurement as an Instrument in Public Health Practice.....	426
Winslow, C.-E. A., Dr.P.H. Discussion of Papers on The Health Department and Medical Care. ....	275
Health Goals for Housing.....	653
Wolman, Abel, Chairman, Committee on Sanitary Engineering, National Research Council, Division of Medical Sciences. Recent Studies on Disinfection of Air in Military Establishments. ....	189
Wolman, Abel, Dr.Eng., Chairman. Report of the Chairman of the Executive Board of the American Public Health Association to the Governing Council 1945-1946 .....	59
Wood, Ronald M. A Darkfield Colony Illuminator.....	205
Woolsey, Theodore D. Morbidity Statistics Through Periodic Sample Surveys of Households. ....	1007
Woolton, Lord. See: The Lasker Awards for 1947.....	1612
Wulfeck, Dr. Wallace H. See: A Proposal for the Solution of the Recruitment Problem..	91

Y

Yankauer, Alfred, Jr., M.D. An Evaluation of the Effectiveness of the Astoria Plan for Medical Service in Two New York City Elementary Schools.....	853
Yellow Fever Vaccination, Simple or Associated with Vaccination Against Smallpox, of the Populations of French West Africa by the Method of the Pasteur Institute of Dakar. Mécécin-Général Maurice Peltier.....	1026

Z

Zaikowski, Leo, Mallmann, W. L., Ph.D., and DeKoning, Paul. Critical Study of Machine Dishwashing. ....	390
Ziegler, Mark, M.D., Weinerman, E. Richard, M.D., and Roemer, Milton I., M.D., M.P.H. Rural Prepayment Medical Care Plans and Public Health Agencies.....	1578